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Facts and Fallacies Concerning Squint (Cross-Eye)

Luther C. Peter, M.D.

TO correct "cross-eyes" in children, treatment should begin before the sixth year, and preferably before the third

Common Misconceptions Regarding Cross-Eyes

POPULAR belief and prejudice are always barriers to progress. This applies with special force to the unfortunate cross-eyed child, although constructive measures are slowly forcing prejudice and ignorance into the background and are giving "the breaks" to him. Cross-eyes, as the condition is commonly known, is defined medically as "a deviation of one of the eyes from its proper direction so that the visual axes cannot both be directed simultaneously at the same objective point." Other terms which are used interchangeably to describe this condition are "squint" and "strabismus."

The layman is not entirely to blame for his misconceptions as to the cause of cross-eyes. Until recent years, the exact sequence of events which lead up to squint was not thoroughly grasped by the average physician. And perhaps the same lack of unity on the part of medical advisers as to the best method of correcting the deformity may be responsible in part for the popular prejudice against the prescribing of glasses for young children and against operating upon the young child when such procedure is indicated.

To laymen, cross-eyes are the direct result of some sudden fright, shock, strong emotion, convulsions, whooping-cough or some other disease of childhood. Hereditary influences seem to be unimportant to them, or possibly it seems only a coincidence that the mother or father, a brother or sister, was similarly afflicted in early childhood. It is but natural, therefore, that another child

in the same family may become a victim following one of the causes mentioned.

As a matter of fact, there is a logical sequence of events leading up to each case of squint. Most children at birth are farsighted to the same degree as the squinting child. The number of children who become cross-eyed, however, is small as compared with those whose eyes are straight. At birth the child's eyes are not perfectly co-ordinated or capable of working together. After six to eight weeks the eyes begin to work harmoniously. Both eyes will fix upon a bright object or follow mother or nurse about the room. At the end of the first year this habit of parallel vision becomes fairly well established. The eyes are straight.

Fusion

In order to use the two eyes together a faculty or habit, known in medical language as fusion, is awakened. Each eye sees singly but the two images become blended or fused into one. In one of the rarer forms of squint this ability to fuse is totally absent. In such instances, cross-eyes may be present at birth or soon thereafter. If the faculty is not present at birth, it cannot develop, nor can it be trained or cultivated. Either eye may turn in and the child may choose with which eye it will fix. The layman says "both eyes turn in." The physician calls the condition an *alternating squint* because either eye may be used to fix.

In the more common type of squint, a fusing power is present at birth but is weak, as are all other mental faculties. It grows and develops and begins to assert itself six to eight weeks after birth and increases in power up to the seventh year.

If no other defects were present, the growth of fusion would continue uninterruptedly and the eyes would remain straight. Unfortunately, farsightedness of high degree is a second factor which interferes with normal progress. Vision is not sharp because of the far sight. In most instances vision is better in one eye than in the other and the eye with the better sight will habitually fix while the image of the weaker eye is ignored. If the fusion faculty is normally developed, the eyes will remain straight, but when fusion is not strong, the weak eye will tend to turn in. This act causes confusion because double images appear. If the eye turns

to a considerable extent, the child can better ignore the image in the weak eye. Medically, this is known as *suppression*. Suppression means the image is ignored, and as a consequence, from nonuse, central vision becomes less and less acute. This adds another factor to the vicious circle. Vision falls rapidly in the eye which turns in and renders the squinting habit easier.

In an untreated case of this character, in which one eye always squints, called in medical language "monocular squint," the vicious circle is: first, far sight; then weak fusion; and later, rapid loss of vision in the cross-eye. Squint or strabismus is now thoroughly established.

Psychological Effect of Cross-Eyes on Child

A final symptom, which has a far-reaching effect on the child, is added. Children of four years become conscious of their deformity. This is forced upon them by taunts from other children. "Cockie," "cockeyed," etc., are epithets which make the child conscious of his handicap. He gradually shuns the contacts of other children, prefers to play alone and loses the influence of comradeship which is natural to the normal child. As he grows older, the defect grows in his consciousness, and an inferiority complex develops which gathers momentum as adolescence approaches. Discriminating parents sometimes sense this change in disposition and eagerly seek the help of the physician. Others seem to fail utterly to recognize the change which develops in the child's mentality and disposition.

As a final step in neglected cases, even though the eyes may eventually be straightened by operation, the results are only cosmetic, i. e., the eyes are straight but vision in the squinting eye remains poor, fusion does not develop and the individual goes through life with one eye, so to speak. Little thought is given to the fact that such individuals are excluded from many useful occupations and vocations in life for which they are otherwise well qualified. This is an economic phase of squint which need not occur if the proper measures are taken at the right time to correct the defect.

Cross-Eyes Can Be Corrected

Those who are interested will naturally ask, what can be done to correct the condition, when should it be done and what can ultimately be accomplished. In the first place, one can reassure parents that all cases of cross-eyes can be corrected but it requires their heartiest co-operation and a willingness to put aside their prejudice and their lay ideas. The matter is entirely a medical one and calls for systematic treatment.

Squint is a condition which develops in childhood, and during that developmental period a cure can be effected in most instances. Unfortunately, in the past, measures to correct this condition were instituted, as a rule, too late to accomplish the results which can now be obtained. In other words, if a perfect cure is to be obtained, all measures leading to its correction must be practised in the formative period of life, i. e., before the patient is seven years of age. Much can be done after this age, but in many instances the cure is only partial. The eyes may be straightened but the squinting eye is almost useless because of the low vision, and the fusion faculty is but feebly operative. The great factor in the cure is the early institution of treatment, in contrast with the popular conception, "to give the child a chance to grow out of his squint." In fact, such measures are responsible for the imperfect cures in the past.

Steps in Treatment

The several steps necessary to bring about perfect results and to place a squinting child on an equal footing with other children are as follows: Testing of vision; fitting of glasses; preventing lowering of vision in weak eye; awakening of the fusion faculty; and finally, when necessary, operation.

As the treatment of the case is a purely technical matter which calls for the highest degree of medical skill, the treatment should be prescribed and outlined by a physician who is specially trained in the treatment of the eyes. The family doctor should first be consulted and he, in turn, can guide the patient into the proper medical channels.

Testing of Vision.—Testing of the eyes for glasses is the first measure which may lead to cure. A high degree of poor vision can and does exist in squinters, a fact which the parents cannot recognize because of the age of the child. Such poor vision can be uncovered and properly measured only by means of "drops," a word which to many laymen possesses a sinister meaning. Most medicines used in the eyes are called "drops," and popular prejudice clouds the situation which primarily is created because the layman cannot and does not know much about medicine. All medicines are harmful when not used in the proper dosage and for the proper purpose. Their right use is a function of the physician, just as the mixing of paint is the prerogative of the trained painter, or the nice adjustment of wood work by one who has been trained in carpentering. Why a layman should hesitate to trust a properly trained physician to know how to use medicines, after years of study and practice, is difficult to understand. One trusts himself and his child to properly trained educators to develop the mental faculties. The analogy can be extended indefinitely, but the same conclusion is reached, namely, prejudice is the basic factor which gives to "drops" the suspicion that they will do harm if they are used.

"Drops" mean atropine when referred to in connection with the fitting of the eyes with glasses in childhood. They will do no harm when properly used, and it is only by the use of drops that anyone can make a true and accurate measurement of the defects of the eyes and the proper glasses can be prescribed.

Fitting of Eyeglasses at Early Age.—If the refractive error is high (i. e., if vision is very poor), glasses should be fitted at the earliest possible moment for a child who squints. Most children will tolerate glasses at the age of fifteen months, notwithstanding the skepticism of many mothers. At this age, glasses accomplish maximum results, and if all squinting children were to be glassed before the end of two years, there would be more cures from squint and fewer operations would be necessary.

Glasses in themselves will not always effect cures. In addition, other measures are often necessary, but at least fifty per cent of cases would not be in need of further treatment if glasses were prescribed and worn before the end of the second year. Furthermore,

if glasses were prescribed at this early age more frequently, when the condition warrants it, poor vision, which as a rule develops in the squinting eye, would occur less frequently.

At this early age and even throughout the school period, tests must be made at frequent intervals. At first, examinations may be required every six months, but later yearly tests may suffice.

Many parents ask, "Can glasses be discarded later in life?" The answer to this common question is: If glasses are helpful in the correction of squint, the refractive error is so high (glasses usually are so strong) that little hope can be extended for discarding them later in life. If the glasses are weak, there is a possibility that they can be laid aside after the active school age. This is the exception rather than the rule.

Preventing Lowering of Vision in Weak Eye.—A third step in treatment is to prevent lowering of vision in the weak eye, or to correct it if it develops before the child comes under the care of the eye physician. In the common form of squint (i. e., when one eye always turns and the other eye fixes) lowered vision is sure to develop unless active measures are instituted to prevent it. It is easy to prevent but difficult to correct unless the treatment is begun early. If proper treatment is practised during the first six years, vision can be restored in practically all cases. If it is not treated before the sixth year, complete restoration of vision becomes increasingly difficult with each year of delay. A few cases recover with treatment after the twelfth year, but they are the exceptions; and varying degrees of defect, with all its handicap, follow the individual through life.

The defect in vision is characteristic, and a properly trained physician can recognize at any time of life that the low vision was due to squint in childhood. The visual loss is largely confined to a small round area, two to three degrees in diameter, in what is known as central or macular vision. Macular vision is the sharp vision in the center of our visual field—the part of our vision which we use in fixing, in analyzing and in reading. If this area is disturbed, reading is impossible. Even minds untrained in medicine, therefore, can understand that such an individual must be excluded from many vocations and occupations in life which call for full vision in both eyes.

Until recent years this loss of vision in the squinting eye was the most discouraging phase of squint. It was thought that little could be done to improve it. Now we can look for cures when treatment is begun before the sixth year, and preferably before the third, if the full co-operation of the parents can be obtained. Our failures in the past were due to the fact that treatment was not instituted early enough and, as a rule, with insufficient care and thoroughness.

The reason for the happy results when treatment is begun early can be readily understood even by the untrained. The child is most receptive, and if training such as this is instituted during the developmental period, it is natural that better results can be obtained. The retina, or receptive part of the eye, is an outgrowth from the brain. It is known that the functional nervous system of the child is not completely formed and developed before the end of the fifth year. Furthermore, experimentally, in treating the child for lowered vision in the squinting eye, we have found it quite easy, in the first six years of life, to transfer the squint and lowered vision to the opposite eye. This cannot be done after the seventh year, showing that the development is completed, or at least that the formative period has passed. It was largely on the basis of this fact which I observed in practice that I have reached the conclusion that the time for treatment is before the seventh year. The results for a number of years past have fully confirmed and justified my belief that all treatment for squint should be completed before the seventh year.

Lowered vision in squint does not mean a congenital defect but a defect which grows out of "non-use." For this reason the medical term applied to it is *amblyopia ex anopsia*—amblyopia from disuse. It is not unlike the placing of an arm in a sling or plaster cast. It becomes weak from non-use but can again be restored by suitable training. In the child, restoration is prompt and complete. In older individuals, and especially when the squint is of long standing, the outlook is less hopeful.

Awakening of Faculty of Fusion.—A fourth measure may be needed in the treatment of squint, namely, the awakening of the faculty known as fusion—the ability to use the two eyes together after they have been straightened. It is normal for the human being

to use his two eyes like two cameras, directed upon the same object but from slightly different angles. Through a mental act, the two images are blended into one. This is single binocular vision. In addition, because the eyes, like binocular cameras, see from slightly different angles, the individual develops a sense of depth, relief and solidity. This is known as stereoscopic vision—the highest degree of vision of which the eyes are capable.

The squinter sees with one eye. In some types of squint a fusion faculty is totally absent. In the more common variety, fusion is present but undeveloped—it is weak. In fact, its weakness permits one eye to wander, and squint becomes fixed. In bringing about cures, therefore, it is necessary to awaken this fusing power. When fusing power is thoroughly aroused by proper training, in many instances, a cure is effected. This part of the treatment is vital but highly technical. Since the reader is interested in results and the means by which they are obtained, details may be omitted.

In the normal child, fusion becomes strong after the first year of life and resists any break in single binocular vision. When it is weak and undeveloped, in the presence of some of the factors previously mentioned, the child gives up the fight against the odds, and squint develops. After glasses are adjusted, and the lowered vision is corrected, training of the fusion faculty may complete the cure. In some instances, however, an operation may be necessary, before fusion can again become strong enough to bring the two eyes into unison. In these cases, fusion training really becomes the final step in the treatment. Fortunately, if all treatment is given before the end of the sixth year, fusion is easily developed and perfect cures are made possible.

Operation for Cross-Eyes.—Operative procedures are necessary in a number of cases. If the squint is not marked, the foregoing methods of treatment usually are sufficient. It is easy to understand, however, why operation may be necessary if the squint is of wide deviation. Changes take place in the weak muscle which is stretched, thinned out and more or less inelastic. Before a cure can be effected, the weak muscle must be shortened to restore its tone. In other instances, the so-called short muscle must also be set farther back on the eyeball. These methods of restoring a

normal balance to the eye muscles bring the eyes into parallelism and the fusion faculty completes the cure.

The operations referred to have been practised for many years, but until recently, they were resorted to too late in childhood, and the other methods of treatment, particularly that of restoring vision, also were begun too late to effect real cures. Operations can restore the eyes to parallelism but they cannot restore vision. The results, therefore, were only cosmetic. The eyes were straightened but the weak eye continued through life as an almost useless member. By operating early, i. e., as soon after the third year as possible, a marked change has taken place in the results. Complete cures can now be expected. The secret of these results lies, first, in the systematic training which has been discussed, and second, in the application of good surgery at a time when natural developmental forces are active, and, therefore, able to aid in restoring the eyes to normal function. It is too late to resort to surgery at ten or twelve years. At such time the eyes can be straightened but the cure is only cosmetic. When surgery is practiced early, before the sixth year, the operations required are less extensive and result in real cures, with full use of both eyes, and with the two eyes working harmoniously as one eye.

Hopeful Prognosis for Cure of Cross-Eyes

This hopeful outlook from the proper treatment of squint has evolved during the last decade. It is no longer a question of straightening the eyes, but one of effecting perfect cures to vision as well, and removing a handicap which has followed many patients throughout life. In this fight against skepticism and prejudice we need the co-operation of the family physician whose good fortune it is to start children into the proper channels for correcting their defects and freeing them from a handicap which will leave a determining effect upon them throughout life. We need the support of social workers, nurses and teachers, who can help to break down the prejudice against glasses and operative procedures, and can help to re-educate parents in the light of the newer conception of squint and its treatment.

Curriculum Problems in Sight-Saving Classes*

Winifred Hathaway

TODAY'S depression slogan—"It's smart to be thrifty"—is perennial with the guardians of eyes who determine sight-saving class curricula

ANY attempt to solve curriculum problems in sight-saving class work must take into consideration the paramount fact that sight-saving class children are of normal mentality. It is not because of their I. Q. but because of their "I See" that special educational opportunities are necessary. Hence there is no basic reason why the children in sight-saving classes should not follow the regular school curriculum, adjusted to their needs, and be kept up to regular grade standards. In fact, there are three pressing reasons why they should do so.

1. There will be found in sight-saving classes pupils of high school and college caliber in the same proportion as will be found in the regular grades. If the school curriculum is not followed and its standards maintained, such pupils find themselves ineligible for high school or college entrance.

2. For a small proportion, at least, of children in sight-saving classes there is hope of improvement in vision. This is particularly true of those suffering either from disease of the eye, or from some systemic disease that affects the eye. Under proper treatment conditions may so improve that the child may return to the regular grade. If he has not been kept up to standard, he is unable to enter the grade for which his mental development fits him and, in consequence, he becomes a discouraged child. For any individual or group, Goethe's lines are pertinent, "He who loses money, loses something; he who loses honor loses much, but he

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who loses courage loses all." For those who are suffering or have suffered from a handicap, courage is even more necessary. Without courage to go forward, all is indeed lost.

3. Here is a group of children of normal mentality; their only handicap is eye difficulty. To offset this handicap they are given individual instruction, educational media suited to their needs, and special attention to their sight. These advantages are offered in order that they may compete fairly with the non-handicapped. Hence it would be quite unfair to them, as well as to the taxpayer, to let them fall below the normal group in their attainments.

Those who are affluent may spend lavishly, but those who have already sustained a loss must spend what is left with the greatest care. In the present financial crisis, there is a familiar slogan, "It's smart to be thrifty." In the sight-saving class there is always a depression in sight values, so that the slogan for this group is perennial. "It's smart to be thrifty," however, can never be interpreted to mean hoarding. Its true significance—wise spending—is of the utmost importance to sight-saving class pupils. The teacher who is trained to understand the possibilities as well as the limitations of eye difficulties will be able to interpret what wise spending of sight means for each pupil in her class.

The purpose of any educational curriculum must be the same for all groups—"To make school life meaningful; to provide opportunities for social participation and personal responsibilities; to find and release resources and creative possibilities." It is evident that curriculum problems for sight-saving classes are concerned with adjustment rather than with the building of a new curriculum. The teacher's aim is so to adjust the regular school curriculum that her pupils will get the greatest benefit, with the least possible eye use.

The Use of the Senses in Learning

The first step toward attaining this desired result is to divide subjects into groups, those requiring close use of the eyes, and those in which the other senses may be used, either in place of the sense of sight or supplementing it to a considerable degree. Certain subjects of the curriculum naturally fall into the first grouping: reading, writing and arithmetic. But even these funda-

mentals of education may be approached from different angles in the normally seeing and in the partially seeing groups. In the former, reading is encouraged not only for informative purposes but for pleasure; in the latter, it must be confined almost wholly to the informational side.

Reading

Those versed in sight-saving class work agree that depriving a child of reading for pleasure is an almost irremediable loss, but a balance must be maintained, and sight is more precious than pleasure. Moreover, in the present day this deprivation is not so great as it seems; modern science comes to the aid of the sight-saving class child. The radio opens up for him much that a comparatively few years ago would have been a closed book. The well trained sight-saving class teacher realizes the necessity for developing concentration and auditory powers, hence a sight-saving class pupil will doubtless benefit more from listening to others read than will the child who is able to read for himself. With the aid of books printed in large, clear type, the sight-saving class child is able to grow sufficiently proficient in reading to permit him to carry on his work and, later, if his sight does improve, he will find himself equipped to enter the field of reading for pleasure.

Writing

Writing, also, requires close use of the eyes, but here again invention has come to aid. The touch system of typewriting offers a medium of written expression that makes communication possible with practically no use of the eyes. If the child is encouraged, just as soon as the mechanics of the machine are mastered, to typewrite his original work—spelling, composition, book reviews, etc.—he is freeing the sight he would have used to prepare these subjects in writing for other purposes for which he must use his eyes. Special typewriters with large type make it possible for the child to correct his own work, wisely spending his sight for short periods. That typewriting represents an economy of sight and of time for all pupils, is being demonstrated by the fact that experimental schools are teaching it even to first grade children.

But for the same reason that he must learn to read, the sight-

saving class child must naturally learn to write. If large letters are used, either on the blackboard with large, soft chalk, or on paper, with large, soft leaded pencils, the work can be accomplished with the smallest outlay of sight, giving the greatest commensurate returns.

Arithmetic

The fundamentals of arithmetic require the reading and writing of numbers and the reading of problems. But here, again, invention has changed the whole aspect of teaching arithmetic. Adding, subtracting, multiplying and dividing may now be accomplished by machine in much less time and with much less incidence of error than when done by human beings. Hence, much of the drudgery of arithmetic drill dealing with large figures that are quite outside of the comprehension of any child, is eliminated. In arithmetic required in everyday experience, the processes are chiefly mental; modern methods of teaching arithmetic emphasize the necessity for practical work and thus curtail, for all children, much needless use of the eyes. This is a boon to the sight-saving class child who may, without undue expenditure of sight, keep up with his normally seeing companions.

History, Geography, Science

Social studies, history, geography, science, fall within the second group since they may be taught largely through the auditory sense. If this method is emphasized for sight-saving class children they may spend their sight wisely for the study of specially prepared maps, not only large enough for them to see clearly, but without the thousands of details that even educators of normally seeing children are coming to realize are confusing and useless.

But this is not enough; for sight-saving class children, in particular, the old Persian saying must be borne in mind: "If you have two pence, with one buy bread to feed the body, and with the other a white hyacinth to feed the soul." There is no reason why sight-saving class children should be deprived of the white hyacinths of the school curriculum. In creative motor activities, the sight-saving class child may readily participate, provided that the economy program for sight is borne in mind and that those

activities are selected which will give the greatest return for the least outlay. Drawing and sewing cannot, naturally, be included in this category, but substitutions may easily be made. Free hand paper cutting and modeling with various types of media, the making of costumes with paper and paste, and sand table projects, satisfy the creative instinct without drawing heavily upon the reserve of sight. Is there any reason why a poster made with figures and letters cut free hand should not count for promotion just as readily as one in which the figures are drawn and the letters printed?

Music

Another white hyacinth is music. The reading of notes calls for such very intensive use of the eyes that, except in cases of unusual musical talent, the outlay is quite out of proportion to the results. But rote singing and appreciation of music are possible without any expenditure of sight, and for short periods of reading simple music, notes may be translated into figures, so that a sight-saving class child showing some talent may not be deprived of his place in the school orchestra. One sight-saving class has a small orchestra of its own that plays, on glasses filled or partly filled with water, many delightful airs from numbers indicating notes.

Art

The sight-saving class child craves color and design particularly because his books, for no apparent reason, are devoid of pictures. With a long handled brush and show card paints he may bring much color and beauty into his world. A long handled brush makes it possible for him to work at an acceptable eye distance and encourages large, rather than detailed, results; show card paints have no irritating glare. A single sweep of a brush rightly used will result in the long, graceful leaf of the daffodil, and a few extra strokes will bring the flower itself to life. Thus most satisfying results may be obtained with the least possible expenditure of sight.

In order to use the school curriculum for the greatest possible enrichment of the program with the least possible outlay of sight, the sight-saving class teacher must understand her work so well

and be so enthusiastic about it that her enthusiasm will be contagious. Why prevent children, already handicapped by defective vision, from enjoying as fully as they can the beauty of the world, when there is a wealth upon which they may draw without detriment to their sight? The art supervisor is not a special supervisor for normally seeing children; she is supervisor for the school system. If the teacher of the sight-saving class can explain to such supervisor the sight limitations of her pupils, as well as their sight possibilities, and can inspire her with enthusiasm for sight-saving class activities, the supervisor will welcome the opportunity to offer most worth-while suggestions. This is likewise true of the music supervisor.

Physical Education

Sight-saving class pupils need physical education quite as much and often even more than the normally seeing. Here again there is room for co-operation with the supervisor and teacher of physical education. If remedial measures are necessary, whether difficulties needing correction are the result of defective vision or not, the same plan should be followed that is used for normally seeing children requiring remedial work. The special supervisor of such remedial work should give the same attention to these children that she would to any other group.

For the general physical education of sight-saving class children, two very definite questions must be answered. Will physical exercises given to the regular group be harmful? Can sight-saving class children, if instructed with large groups, see well enough to follow the exercises demonstrated by the teacher of physical education? If not, they may interfere with the group as a whole.

It is usually possible for a teacher of physical education, provided she understands the limitations and possibilities of the sight-saving class pupil, to make the necessary adaptations for him, especially if the work is so well done in the sight-saving class that the child himself understands his own limitations and possibilities and obtains the consent of the teacher of physical education to omit such exercises as he knows will be harmful. Thus both the teacher of physical education and the child who has serious progressive eye trouble will realize that violent exercise, such as diving, may increase the difficulty. Hence both will co-operate to limit

the exercising to what can be undertaken without harmful results. The child with low vision who cannot see well enough to follow directions may request and be given a place near enough to the teacher to insure no interference with the work of the rest of the group.

Principle of All Curriculum Making

The White House Conference lays emphasis upon the fact that education must be founded upon strength and not upon weakness. Remedial measures may be, and usually are, necessary for the handicapped, but it is never upon their weakness that education is built. The first step in all modern education is to find wherein the strength lies and to build upon that as a foundation. In all curriculum making this is taking paramount place. It must be applied to the handicapped child as well as to the normal child, and, just as under normal conditions, adaptations must be made, so in handicapped groups a curriculum suited to the individual need of the child will, in time, be developed.

No longer are poets refused college degrees because they cannot work problems in differential and integral calculus, nor is the mathematician disqualified because he cannot write an ode to Sylvia. In like manner, the sight-saving class boy can no longer be deprived of promotion or entrance to high school or college because he cannot make a mechanical drawing, nor can the sight-saving class girl be so deprived because she cannot sew a fine seam. Just as the poet may be permitted to substitute his ode for the mathematical problem, and the mathematician the solution of his problem for the ode, so the sight-saving class child may offer those achievements that lie along the line of his strength.

So, too, may be developed his inherent qualities through wise planning to meet each special education problem. First must come understanding of the problem; with wise understanding there will develop that co-operation which is essential to desired results. Was not this what Violet Alleyn Storey meant when she wrote:

> "Milton, the blind, who looked on Paradise!
> Beethoven, deaf, who heard vast harmonies!
> Byron, the lame, who climbed toward Alpine skies!
> Who pleads a handicap, remembering these?"

Nutrition in Relation to the Eyes

Park Lewis, M.D.

VITAMIN A deficiency in the diet may result in "night blindness"—manifested by a difficulty in seeing under faint illumination, as in twilight. This is only one of the eye conditions resulting from diet deficiency

THERE is, perhaps, no word that has grown more in popularity within the past five years than the word "vitamin." It has invaded the parlance of the butcher, the baker, the grocer, the housewife, the advertiser, as well as of the doctor, the nurse and the dietitian. Orange juice, cod liver oil, rice, and fish (to mention but a few), are no longer merely so much food, but possessors of forces which make or break the human body. The mother of today knows that cod liver oil is given to prevent rickets; that orange and tomato juices possess powers to prevent scurvy; that even bananas, which were considered practically poisonous for children, are now included in babies' diets as healthful food.

Eye and Body Structurally Related

With the consciousness of the ability to develop a healthy and stalwart body, has developed the knowledge that general weakness of the body may result in a weakness of any of its parts. And, conversely, a weakness of one organ of the body may unbalance the sturdiness of the whole body. It is easy to understand this when we consider the development of the body from its very conception. Let us see how, from the embryonic state, the eye grows as a part of the body.

In the process of the development of the fertilized ovum into the embryo, the primitive cell divides into two cells, these into four, these again in eight, continuing to double until a structure is formed. This gradually separates into three layers: an outside

which is known as the ectoderm; an inner, the endoderm; and a middle, or mesoderm. Out of these grow all of the tissues of the body, and they retain throughout life certain characteristics of the original structural layer. The outer layer, or ectoderm, forms the skin and lining membranes of the anterior portion of the mouth, nose and eyes. From this layer grow also the eyelids with the glands upon their margins; the cilia, or eyelashes; and the mucous membranes with which the lids are lined. From this layer, too, come the ocular nerves and the epithelial or covering membrane over the cornea which is the transparent part of the eye.

Therefore, it can be understood that when conditions arise causing skin disturbances, we may look for like developments in other structures which came from the same embryonic tissue. Corneal ulcers, mucous inflammations and other destructive changes are examples of eye symptoms which may be related to skin disorders.

From the middle layer come the great internal organs. From this also are formed the vascular tissues, the humors of the eyes and the muscles of the eyeballs. It is well to bear this fact in mind as we study the effect of nutritional imbalances on the eyes, for any or all of these structures are affected by excesses or deficiencies in the nutritional requirements. It must not be forgotten either that mechanically and chemically the changes that take place in the animal body in its growth and development are closely allied to those which occur in the combustion of fuel in a furnace. In both instances it is the development of energy through the destruction of heat-producing substances. In the furnace are burned hydrocarbons in the form of wood and coal; in the animal body are consumed the carbohydrates, and both in the presence of oxygen.

Food as Fuel

One of the most important advances that have been made in our food problems is the recognition of what is known as the isodynamic law. Briefly stated, it is that food consumed within the body will liberate the same amount of energy that it would if burned in oxygen outside of the body. The amount of heat produced is measured by a unit known as the calorie. The number of

calories that should be consumed in the animal body is conditional upon the energy required. This is determined by the age, the habits and the occupation of the individual. If the number of calories taken into the body is greatly in excess of their possible consumption, deposits of fat may be found. The substances that are required in the system for the maintenance of normal health are the proteins, the carbohydrates, the fats, certain mineral elements, water and vitamins. An excess or a deficiency of any of these will result in a systemic imbalance through which the eyes as well as other parts of the body may suffer.

To make this more clear a few words must be said concerning each of these essential elements. The proteins are absolutely necessary to life. They replace the losses in the soft tissues. While they are found both in vegetable and animal substances, the vegetable protein is not of as good quality as the animal protein. Both, however, are needed. Protein is abundant in cereals, beans, peas, nuts and other vegetables, and in meat, eggs, milk and fish. Liver has a high protein value. From sixty to one hundred grams of protein a day should suffice the normal person. The American dietary is usually too high in protein content. Therapeutically, it has been found that an abundant protein diet is a valuable aid in treatment of wounds.

The carbohydrates include the sugars and starches; stored in the body they increase the deposit of fat. They are found largely in the grains and root vegetables, such as rice and potatoes. Many children suffer from inflammatory lid and corneal troubles which are brought on by the excessive use of sugar and candy. The overweight diabetic having too rich a diet of starch or sugar will often develop cataract, manifesting itself at its commencement, in an adult, by an increasing myopia. With it also are found retinal changes and not infrequently hemorrhages. The fats taken in suitable quantities are found both in animal and plant life. The fats of milk, butter and eggs are of the highest importance. Those of certain salt water fish as the cod and halibut contain iodine. In the liver of the fish this is found in large amounts. Vegetable oils lack essential mineral and vitamin qualities that are found in animal oils. It has been thought by some observers that calcium deficiency through its effect on the endocrines may have an im-

portant bearing in glaucoma. In those who are undernourished an excessive intake of salt interferes with digestion and may unfavorably affect a retinal inflammation.

The Vitamins

It has been only during the last quarter of a century that the researches of a number of investigators, many of them American, have explained the principles of the historic dietetic procedures, such as: the use of fresh vegetables and citrus fruits in the treatment of scurvy; cod liver oil in rickets; feeding of liver in night blindness; and the substitution of barley for polished rice in beriberi. An extensive medical literature has grown up during the last few years on the subject of vitamins and more particularly on the wide range of usefulness of vitamin A.

Vitamin A.—This has been of special importance because it has to do with changes occurring in the eyes. It has been known for ages that certain conditions of malnutrition had an affect upon eye changes, and as long ago as the time of Hippocrates the use of liver was recommended for nigh blindness. Livingstone, when exploring in Africa, related that when his party was obliged for a time to live on roots and meal, there developed an affection of the eyes like that found in the case of animals limited to a starchy diet. Poorly nourished slaves in Brazil during the last century suffered from a condition of night blindness or dryness of the conjunctiva. This condition has recently been well understood and found due to the absence of vitamin A in the diet. In an institution in Copenhagen the young children were divided into two groups, one group received milk, a plentiful source of vitamin A, and the other received fat or vegetable fat in margarine, lacking in this essential. In eight cases among those on the vegetable diet, xerosis developed and was subsequently relieved by cod liver oil. On the other hand, in the group given whole milk, no disturbances occurred.

In 1919 it was discovered that the distribution of vitamin A is closely related to the yellow pigmentation found in certain fats. Carotin is closely allied to vitamin A and a very small amount will overcome vitamin A deficiency. Vitamin A deficiency may result in two types of change, night blindness (hemeralopia), and

those corneal changes known as xerophthalmia (condition of great dryness) or keratomalacia, which means breaking down or softening of the corneal tissues. Night blindness is manifested by a difficulty in seeing under faint illumination, as in the twilight. The retina of the eye contains a large amount of vitamin A and in its absence this imperfect functioning is evidenced. Pillat, who has had experience with deficiency diseases in China, found not only night blindness but inflammation of the meibomian glands in the lids, marginal inflammations and sties, decreased lacrimation, puffiness of the lids, and blackheads, or comedones. He considers keratomalacia as the final stage of vitamin A deficiency in the eyes of adults. When the surface resistance is lowered, various bacteriological infections may readily follow.

Vitamin B.—Vitamin B, the second of the vitamins which are designated by the letters of the alphabet, has two fractions, known as B_1 and B_2. B_1 is antineuritic. It is not stored in the body to any great extent. Foods containing it should, therefore, be part of a continuous diet. Its absence causes affections of the nervous system, resulting in irritation and weakness of the eyes. It is often low or lacking in the diets of those suffering from iritis and other involvements of the uveal tract. The separation of these two fractions has not yet been thoroughly analyzed but both seem to be necessary. Although the wheat germ is exceptionally rich in this element, white flour from which the germ has been eliminated is lacking in the B complex. It is also found in milk, green leafy vegetables, in bananas, in yeast and in fruits. It is lacking in the highly refined foods.

Vitamin C.—Vitamin C is insoluble and disappears in foods heated in the open air. It is largely lost in canned foods unless they first have been soaked in salt water. A generous amount of vitamin C is needed for the maintenance of good health. It is found in the citrus fruits, in berries, in tomatoes, in cabbage, lettuce, onions, peas and spinach. There is little or no vitamin C in cereals and meat, and a small amount in milk.

Vitamin D.—Vitamin D is found in few of the natural foods but is in cod liver oil, liver and yolks of eggs. It occurs largely in sea fish and sea foods. Steenbock recently found that the irradiation of foods with ultra-violet light gave them the properties of vitamin

D. By this process many edible products are now sold containing this important element which they would otherwise not have.

Vitamin E.—Vitamin E is essential for fertility and is found in the vegetable oils and in wheat embryos. Lane believes it to be probable that a disturbance of balance in the body salts may have a bearing on the production of cataract and glaucoma, but in that they are so essentially different, the same cause can hardly apply to both.

Deficiency Diseases Related to the Eye

The late Dr. James A. Stucky, who was very familiar with the conditions of the mountaineers in Kentucky and Tennessee, was of the opinion that many diseased conditions of the eyes in those sections were caused by malnutrition. In the badly ventilated and crowded hovels in which many of these people live he found insufficient food, badly prepared. Meats were fried, and vegetables were boiled until all the essential substances were taken out of them, and the juices ("pot liquor") were given to the pigs. The pigs were fat and well nourished while the children were scrawny and weak. Throughout the mountains were many cases of inflammations of the eyes. When poor living conditions and diets were changed the eye diseases largely disappeared. A deficiency of vitamin B, said Stucky, impairs the appetite and digestion, produces constipation, causes subnormal temperature (cold hands and feet) and various other manifestations referable to the nervous system.

Bell has shown the influence of diet in many clinical cases of corneal ulcer, keratomalacia, glaucoma, choroiditis and other ocular diseases. Stucky was of the belief that trachoma was a deficiency disease which was dependent upon faulty or ill-balanced food supplies. An excessive starchy diet in young children will sometimes so affect the eyelids that sties and cysts are produced; and the tendency may be controlled, when no refractive strain is present, by a regulation of food intake.

Scurvy is essentially a deficiency disease and is manifested by hemorrhages. These sometimes occur in the orbit and result in a pushing forward of the eye. This is a sign that should be borne in mind as it may easily be confused with other conditions causing

this symptom. Guiseppe, writing in an Italian journal, found cases of cataract, iridocyclitis, glaucoma, paralysis of the external rectus muscles of the eye, choroiditis and retinitis, in diabetics not using insulin. In iridocyclitis the inflammation was modified when treatment with insulin was begun. Under suitable diet and the use of insulin, cases of myopia and choroiditis were improved. Eye surgeons recognize the necessity of reducing the blood sugar in diabetic patients by the use of proper diet, before subjecting them to surgical operations.

In cases of true or pseudo-pernicious anemia in which there were retinal hemorrhages with fullness of the veins and pallor of the optic discs, the hemorrhages cleared up, leaving no trace, and the pallor of the optic disc and the retinal edema were improved within a month under a diet of partially cooked liver, which is rich in vitamins. In Bombay, keratomalacia was very common, due to a deficiency of proper food elements. The first symptoms were night blindness with dryness of the cornea and conjunctiva. As the disease progressed, disturbances resulted in the formation of ulcers, with sloughing, perforation and panophthalmitis. Under proper treatment, taken sufficiently early, these conditions were promptly relieved.

The importance of a recognition of food deficiencies has long been recognized in the more pronounced forms, such as scurvy, beriberi, pellagra, etc., but it must be remembered that slighter manifestations of all of these conditions may also occur when there is not a complete absence, but merely a limitation, of essentials in diet. It is important, therefore, in considering diseases of the eyes, that a regulation of diet be given prime attention, especially when such conditions cannot be ascribed to other causes.

How Our Schools for the Blind May Assist in Preventing Blindness*

Lewis H. Carris

SCHOOLS for the blind may aid in the conservation of vision by ascertaining whether all possible treatment and operation have been provided to restore sight or to prevent its further deterioration. They may be of great help also by emphasizing to the public that many of their pupils are needlessly blind

THERE is a major distinction between welfare work for the blind and prevention of blindness in the fact that the former deals almost exclusively with the end results of eye catastrophes of all kinds. The potential client for service by welfare agencies for the blind has presumably had all possible medical and surgical attention in an attempt to save his vision; far too often this is a losing fight and the oculist finally pronounces the sight lost. Then, and then only, must the adjustment of the individual be made to a darkened or black world. It is this adjustment with which agencies for the blind are primarily and constantly concerned. This is the work of societies for the blind, commissions for the blind, the Braille press, and the schools for the blind.

Responsibilities for Prevention of Blindness

Prevention of blindness, on the other hand, includes all those activities of society that may help to retain sight. Its aspects vary in scope and definiteness and cover a long list of services. Theoretically, yes even possibly, every one is in danger of becoming blind. Prevention of blindness seeks to discover eye hazards and to set up warning signs that all may read while they still have sight. This work includes the education of society in the matter of proper eye hygiene, the avoidance of eye diseases, the importance

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of prophylaxis at birth, the prevention of eye accidents, good illumination, the early detection of defective vision and its proper correction. In a word, this part of the prevention of blindness program may be expressed in the slogan, "Keep well eyes well." Organized work for prevention of blindness attempts to set up an active co-operation with all agencies of society directly or indirectly concerned with the conservation of vision, and the list is a long one; for after all, there are few agencies of society which are not involved in the saving of sight. To name only a few,—school systems, public and private; national, state, and municipal boards of health; safety councils and societies; illuminating engineers; public health nursing organizations; public libraries; parent-teacher associations, and organized social work. The prevention of blindness unit must make itself an authority to which all may turn for help in keeping eyes well and in detecting potential cases of blindness as early as possible.

The second and more concrete responsibility of prevention of blindness is to seek out the potentially blind person and to bring to him all possible surgical, medical, hospital and social service to the end that blindness may be averted. It is based on the assumption that at least half and probably more than two-thirds of all blindness can be avoided by universal application of the facts already known in medicine, surgery, accident prevention and the laws of heredity.

These distinctions indicate the basic differences between the American Foundation for the Blind and the National Society for the Prevention of Blindness, and in general follow through all similar activities wherever found. The thinking on this subject is usually confused through the fact that the same agency is often intrusted administratively with the two kinds of work. Many of our state commissions for the blind have active and effective departments for the prevention of blindness, which are more active and effective as the two types of work are more separated and have individual budgets and different personnel.

Joint Responsibilities for Blindness Prevention and Care of the Blind

For the purposes of illustration and theoretical discussion, let us imagine two circles—one to include all activities for prevention

of blindness and the other all activities for the welfare of the blind. Would these circles be separate, tangent, or intersecting, or would one include the other? It is apparent that they would intersect, but that the common area would be very small. It is also apparent that the diameter of the prevention of blindness circle would be much longer than that of the welfare circle. An examination of the items included in the prevention of blindness circle would indicate that they range from the nebulous conception of popular education in items of vision conservation to the hospitalization, operation or treatment of glaucoma or trachoma cases; while the welfare circle, though much smaller, is made up for the most part of the items of education, employment, support and recreation.

It is to be emphasized that the two circles do intersect and it is important to consider just what elements are included in the common segment. What is this community of interests, even if it is small? First of all, it is important that no individual should remain blind if medical or surgical treatment will restore sight. Because of the imperfect organization of society in its prevention of blindness activities, individuals whose sight may be salvaged are often presented as applicants for service by welfare organizations for the blind. The institution, whether school, workshop, or society for the blind, has the important responsibility of admitting for permanent aid only those whose diagnoses of blindness have been made by competent medical authorities. Where there is any doubt, service must be provided either by this agency or by an agency engaged in prevention of blindness as such. There can be no more glorious accomplishment for a school or workshop than to restore to the ranks of the sighted one who has been considered blind. The number of such individuals is, of course, relatively very small, yet is great in importance.

Even in cases which apparently offer no hope of restoration of vision, the school for the blind has a responsibility for obtaining complete eye examinations. In the first place, it is important in the educational process that the teachers and others who are to help the child to make the best use of his powers should understand (as well as it is possible for a layman to understand medical diagnoses) the exact degree and nature of the child's disability.

A teacher who has this knowledge will be able not only to train the child in the use of his remaining visual perception, but also to help preserve such vision by guarding against its overuse. Another service which schools for the blind can offer toward prevention of blindness is the provision of accurate statistical data on causes of blindness. There is a crying need for such material in order that the prevention of blindness worker may be provided with the necessary arguments and tools for his work.

In the adjustment of an individual to his environment, it is generally agreed, the greatest possible use should be made of any remaining sight. The person who can distinguish between darkness and light has some advantages over the totally blind. One who can distinguish fingers at arm's length has an advantage over both. One who may be totally blind as far as reading the largest print is concerned may still be able to avoid obstacles; and so we might grade people from those who have seriously defective vision to the person with perfect vision.

The process of sight-saving has two aspects: first, and primarily, the treatment and correction of eye diseases and eye defects so that the vision may approach normal, and the prevention of retrogression of vision; and, second, the creation for those of very limited vision, whose eye conditions are static, of an environment which approximates that of the sighted rather than that of the blind world. A confusion of thinking has grown up around this secondary meaning attached to the term, "sight-saving," referring to the process of helping individuals to make use of their remaining sight in securing an education and participating in life's active work.

As an example of the term, sight-saving, in its secondary meaning, we may mention the conservation of vision classes. The services of such classes may be divided into two categories: (1) providing the ophthalmologic and pedagogic needs for children with seriously defective vision, whose eye conditions might progress toward blindness if they were not supervised both medically and educationally; and (2) providing for children of very limited vision, whose eye conditions are static with no hope of improvement nor fear of further deterioration. While it may be true that the sight-saving class does not improve the vision of this latter

group, it affords an opportunity for these children to live in the sighted world as sighted persons instead of being relegated to the life of the blind, with its limitations. Under the guidance of the sight-saving class, these children can be taught to make the most of their remaining vision; frequently, they can overcome their handicaps and participate in some form of vocational activity.

Educational Differentiation Between Blind and Sighted

There is general agreement that, educationally, the decisive point differentiating between a blind and a sighted person is whether there is enough sight to make possible the use of print in securing an education. If print can be used, conservation of vision classes should be made available. If education must come almost wholly through the tactile and auditory senses, then the school for the blind is the place for education.

There is one other guiding principle which we believe to be true. Wherever possible, it is advantageous to keep the partially sighted person in the world of the sighted, and not in the world of the blind. There have unquestionably been many tragic cases of partially sighted children who have been sent to schools for the blind and who have realized only too late that they could have been educated by visual methods.

What has been said so far relates almost wholly to the fundamental distinctions between and the common activities of prevention of blindness and welfare work for the blind and the underlying principles involved in both cases. The specific question indicated in the title of this paper deserves a more specific answer.

Responsibilities of Schools for the Blind

There is little that the school for the blind can do in the general activities for prevention of blindness in the sense of furnishing authoritative information to agencies of society for "keeping well eyes well." This does not at all mean that the individual principal or teacher may not be actively engaged as an interested citizen in the promotion of prevention of blindness. No doubt, many teachers in schools for the blind become interested in prevention of blindness through the needless tragedies they encounter in their work. My experience in both the educational field and in

prevention of blindness leads me to view with respect both fields of activity and to assert with some assurance that the job of running a school for the blind is in itself a major task.

One specific thing that a school can do in the general field of prevention of blindness is to give publicity to the fact that many of its pupils are needlessly blind. It is through attempts to alleviate the ills of society that the necessity for prevention is realized. It is to their everlasting glory that from the principals of schools for the blind largely grew that part of the work which has resulted in the extensive lay movement for the conservation of vision conducted in co-operation with the medical profession.

Responsibility for Restoration of Sight

Schools for the blind may aid in the conservation of vision by ascertaining whether all possible treatment and operation have been provided to restore sight or to prevent its further deterioration. This means competent ophthalmological supervision and, in many instances, the provision by the school of such treatment or operation. Every school sending back one of its pupils to the sighted world deserves a distinguished service badge for work in the prevention of blindness. It is certainly true that there are many children now in schools for the blind who could have their sight restored. In regard to one school, that at Romney, West Virginia, Dr. J. E. Blaydes, an oculist, states in a report to Dr. W. T. Henshaw, state health commissioner, that of the 114 pupils examined, in his opinion, eleven could be restored to normal vision; eight could be given vision of 20/30 to 20/50; seven could be given vision of 20/50 to 20/70—sufficient for reading; three could be given vision of 20/100 to 20/200; and three could be given "travel vision." This makes a total of 32 of 114 individuals, or about 29 per cent, who might have their sight improved by proper medical and surgical attention.

Apropos of the secondary meaning of the term, sight-saving, schools should make use of any remaining sight in the educational process. No child should be retained in a school for the blind and be forced to read with his fingers when he can make advantageous use of his eyes. Even when there is a prognosis of blindness, it is probably inadvisable to teach braille unless the physician refuses

to permit the use of sight under any circumstances, and in this case the child should not be admitted to the school until actual blindness occurs.

Policies of Enrollment in Schools for the Blind

There are two policies generally observed in admitting pupils to schools for the blind: either confining enrollment to those educationally blind, or enrolling both these and the partially sighted (those who are not educationally blind). We believe that the educational processes for the two groups are so different that the policy of admitting only those who are blind should be strictly followed. If, however, schools for the blind are obligated by law to admit partially sighted pupils, they should differentiate between these groups as far as is administratively possible.

Until the time when a change in the law will make it possible for the school to confine its activities to the real purpose for which it was established—the education of the blind child—arrangements must be made that the child with seriously defective vision who finds himself placed in a school for the blind shall be instructed by educational methods adapted to the use of the sighted, as now carried on in sight-saving classes in public schools. This would include adequate lighting, the provision of clear type books, a teacher especially trained to give such instruction, and ophthalmological supervision of eye conditions.

Even among the pupils who can legitimately be classed as blind, there will be in every school varying degrees of visual perception. In a school where the equipment is provided chiefly for those who are totally blind or have barely light perception, it is possible that certain environmental conditions and certain methods of teaching would have to be more carefully adjusted and censored for the group who have some vision. The child who can see a little will, unless prevented from doing so, try to use his eyes in processes designed for the sense of touch. This is frequently the case when children of even very limited visual acuity are taught braille; the result is that the slight vision which they have is endangered when it might have been preserved, if not improved. A further handicap for the child of limited vision, as well as for the teachers, in schools for the blind is the poor lighting in classrooms, corridors

and other places of assembly in some of these institutions. So far as the blind are concerned, the factor of lighting is secondary; but with those who have some sight the tendency to utilize the eyes even in poor light results in a strain on the visual powers. Of course, poor lighting is not encountered in all schools for the blind, but it is likely to occur more frequently there than in the regular schools.

What has been said about conserving the sight of pupils can also be applied to the necessity for providing working conditions suitable to conserve the eyesight of the teaching staff and employees generally.

Should Schools for the Blind Maintain Sight-Saving Classes?

It must always be kept in mind that the successful instruction of the sighted (with seriously defective vision) is a distinct problem in almost all of its aspects from the successful instruction of the blind. The question has often been raised as to whether or not a school for the blind should maintain conservation of vision classes. Educationally all arguments are against this practice. Briefly summarized, the reasons are:

1. The necessity for keeping sight-saving class pupils in the world of the sighted. This means mingling with sighted pupils and following the non-segregated plan so successful in the public schools.
2. The fact that the educational processes for the blind and the sighted are so different that it is rarely that the same teacher can succeed in both types of work.
3. The difficulty of successful administration of the mixed groups.
4. The tendency in schools for the blind to overwork the partially sighted in guide service and other personal service requiring the use of the eyes.

Those of us who are interested in the establishment of conservation of vision classes in the public schools recognize the responsibility of the state and local community for the education of the isolated child who resides in a district too small to maintain a class. So far there have been established only three county classes using the transportation system of the consolidated school to bring children from great distances. It is not at all likely that the county

class will prove the ultimate solution of the problem of the rural school child with seriously defective vision. Yet it is not probable that the state will set up a separate school for these pupils. In such cases it would be better to board a sight-saving class child under proper home conditions than to have him enrolled in a school for the blind.

With the increasing success of prevention of blindness work, there will be a decreased attendance at schools for the blind. Already evidence indicates that for the past quarter of a century there has been a relative decrease in the number of blind children attending schools, even taking into account the day schools for the blind established in the cities. The growth of the general school population has far exceeded the growth in registration at special schools for the blind. This is true in spite of the greater efforts that are being made to find the blind children and to urge their attendance at schools. It is also probable that there are at present included among such pupils a considerable number of blind children with poor physical stamina who survive only because of the effectiveness of the modern health movement. Unquestionably, the reduction of infant mortality carries in the wake of its great wave of public welfare a flotsam of individuals poorly equipped for life's struggle. Blindness is often the evidence of a loss borne by the frail body barely saved from death. There, too, the survival of the more or less unfit brings a crop of blind pupils with the additional handicap of feeblemindedness. These are all problems which must confront the administrative head of a school for the blind endeavoring to keep his institution apace with a rapidly changing world.

In conclusion, we must express again the great appreciation for the individual efforts made by superintendents of schools for the blind in promoting activities for the prevention of blindness, and this usually in addition to the heavy administrative tasks with which they are already overburdened.

The Medical Aspects of the Visually Handicapped*

Frank H. Rodin, M.D.

IN 1907, approximately 28 per cent of the children admitted to schools for the blind in the United States had lost their sight through ophthalmia neonatorum. In 1931, this was reduced to 7.5 per cent

What is "Visually Handicapped"?

BEFORE proceeding with the paper it is well to attempt to define just what we mean by visually handicapped. In the broad sense it means a condition where the vision is so poor that the individual is greatly handicapped as compared with a person with normal vision. He has difficulties in reading, getting around with ease, seeing distinctly, ability to earn a livelihood, etc. This includes individuals whose vision in the better eye is 20/70 or less; that is, less than 65 per cent in the better eye. Included in this group are those people whose vision is such that further loss of vision may take place unless special precautions are taken, such as education in sight-saving classes or prevention of the use of the eyes for close work.

What is Blindness?

Blindness, as defined by Webster, is the state or quality of being blind, that is, destitute of the sense of seeing, either by natural defects or by deprivation. For practical purposes, blindness may be defined as a condition where the vision is reduced in the better eye to 20/200 or less. This is 20 per cent of vision or less. Most of the people who are considered blind are those whose vision is limited to the recognition of fingers at 10 feet or less. Various

* Read before the Northern California Council for the Education of Exceptional Children at the Third Annual Session, Mills College.

eye lesions may modify these standards defining the visually handicapped and the blind.

Prevention of Blindness

As prevention plays an important part in preventing the loss of vision, a few remarks about it will not be out of place. The most striking result of prevention of blindness is the reduction of the number of cases admitted to the schools for the blind due to ophthalmia neonatorum. In 1907, 28 per cent of those admitted were blind from ophthalmia neonatorum. In 1931 this was reduced to 7.5 per cent. Even this is 7.5 per cent too high. Considering this from a different angle, we may say that in twenty-four years ophthalmia neonatorum as the cause of blindness was reduced 73.4 per cent. Or, in 1907, the cause of blindness in one out of four children was ophthalmia neonatorum. In 1931, ophthalmia neonatorum was responsible for one of thirteen children admitted to the schools for the blind. There is no reason why any child with ophthalmia neonatorum should become blind. This is well illustrated by the work done in the State of New York by the Prevention of Blindness Department, New York Commission for the Blind.* The legislature gave them a fund with which to provide emergency hospitalization for cases of ophthalmia neonatorum, pending the making of arrangements with responsible officials. With this fund, the Commission provides immediate hospitalization for such infants and, in special cases in which the parents refuse to allow the baby to go to a hospital, will meet the expense of a special nurse at home. During the last three years 163 cases were registered. In the first year seven babies became blind. In the second year three babies lost their vision completely; a fourth lost the sight of one eye; two had only partial vision. In the last year no baby lost his vision from ophthalmia neonatorum in the State of New York. I have dwelled on ophthalmia neonatorum rather lengthily as here is one condition which, under proper and early care, can be cured. Unfortunately, we are not able to show such marked improvement in the prevention of blindness for other eye ailments.

* Responsibility of New York State to Prevent Blindness, G. S. Harper, SIGHT-SAVING REVIEW, 1:43–51 (Sept.), 1931.

Syphilis.—Syphilis is still responsible for a great many cases of poor vision. In childhood a condition known as interstitial keratitis, which affects the cornea, often leaves opacities of the cornea which greatly reduce the vision. Congenital eye lesions, reducing the vision, are common in syphilitic children. The majority of optic atrophy cases we see in adults are caused by syphilis. In addition to this, syphilis is responsible for many diseases of the eye which affect the vision greatly and often cause blindness. In a previous paper* I showed that one of ten persons with syphilis had an eye lesion, and some of these lesions were optic atrophy, changes in the retina and in the choroid—lesions which reduce the vision greatly and are the cause of a great deal of blindness. Of 1,000 patients studied, 20, or two per cent, had optic atrophy, indicating that approximately two per cent of the syphilitics will develop optic atrophy, one of the causes of blindness.

The prevention of syphilis and the early recognition and intensive treatment of this condition, are very important in preventing the serious complications that this disease effects on vision.

Glaucoma.—The disease of the eye known as glaucoma causes about one-third of all blindness occurring in the latter part of life. Glaucoma is commonly known as "hardening of the eye," and it represents an increase of pressure within the eye. It is impossible to consider at this time the causes and symptoms of glaucoma. The unfortunate part of this condition is that the patient is often unaware that he has a serious eye lesion, for the commonest type of glaucoma gives no pain. The person grows aware that his vision is becoming poor and that he does not see well about him (defects in the visual fields). Unfortunately, these people often do not present themselves to eye physicians until the loss of vision is so great and the damage to the eye is so advanced that very little can be done for their vision. This condition is easily recognized by an eye physician on examination and, in the early stages, progress may be arrested and the vision may even be improved. This increased tension presses on the delicate and easily vulnerable fibres of the optic nerve, causing damage. If the condition is not treated medicinally or, if necessary, surgically, the

* Eye Lesions in Patients with Positive Wassermann Reactions, F. H. Rodin and J. G. Carson, J. A. M. A., 93:360–361 (Aug. 3), 1929.

optic nerve may be permanently damaged. Glaucoma acts like a thief in the night. And by the time the person with glaucoma becomes aware of the loss of his vision often very little can be done to restore it, although much can be done to prevent further loss. If, late in life, the vision cannot be corrected to normal with glasses, a patient should consult an oculist to be assured that he has no glaucoma which is responsible for the poor vision. It is very tragic that these patients do not avail themselves early enough of the aid of an eye physician.

Eye Accidents in Childhood.—About 1,000 children receive eye injuries in the United States every year, the majority of which are avoidable.

Parents do not often recognize the danger of letting young children play with sharp instruments, such as scissors, knives, forks, and so on. It is the common experience of every physician to see eye injuries to young children caused by such articles. Usually two children will play with a sharp instrument and one child will injure the other child's eye. Fortunately, as a rule, only one eye is injured. The injury is usually a perforation of the eyeball with either the loss of the eye or a blind eye. In 1928 I reported three such cases.* One case I saw occurred in 1926. A girl thrust a butcher knife into the eye of her sister—a child aged six years. The eye had to be removed. In 1927 I saw a girl aged three and one-half years, who injured her eye with a knife while playing in the kitchen. This child developed a traumatic cataract with an obliteration of the pupil. In 1928 I saw a boy, aged five years, who received an injury to his eye while playing with his sister who thrust the point of a pair of scissors into his eye. A traumatic cataract formed.

The sensible celebration of the Fourth of July reduces greatly the number of eyes injured both of children and adults.

Eye Accidents in Adults.—We see many preventable eye accidents in adults. A great many of them occur in industry. This type of eye accidents may be greatly reduced by the education of the employees to the wearing of goggles and in the designing of machinery in such a way that particles of flying metal are reduced

* Perforating Eye Injuries of Young Children; Report of 3 Cases, F. H. Rodin, California & West. Med., 29:338–339 (Nov.) 1928.

to the minimum. It is considered still one of the greatest causes of needless blindness.

Sight-Saving Classes.—Sight-saving classes* make possible the proper education of children having seriously defective vision. These classes probably play an important part in the prevention and the lessening of the progress in progressive myopia. A proper education for the children so handicapped is almost impossible in a regular classroom. For children with progressive myopia, attendance in regular classes is harmful; and other children with poor vision have a great deal of discomfort and get very little from the regular classes.

These special classrooms, and that also applies to the regular classrooms, should be well illuminated. We will all agree that nothing can surpass the light from the sun. Unfortunately, this light is not always constant in a room. We often have too much sunshine and more often not enough. The desks in the room should be so arranged that advantage may be taken of the maximum amount of light. The blinds should be so adjusted that no glare is present. The best type is the Venetian blind, as it can be adjusted so that the light can be permitted to enter the room and directed to the ceiling and reflected indirectly on the desks. The desks should be free of shining surfaces. It is advisable to have from 15 to 20 foot-candles of light in the room. This illumination should be free of glare. Artificial illumination should be used when needed.

The posture of these children should be watched, as they have a tendency to assume slouchy positions when sitting at their desks.

Of course the visually handicapped, including the blind who have some vision, should have their eyes periodically examined by an eye physician. No person should be admitted to a sight-saving class or a school for the blind without a proper eye examination by an eye physician to see if the vision cannot be improved medically, surgically, or with glasses.

* Sight-Saving Classes in California, F. H. Rodin, California & West. Med., 30:251–255 (April) 1929.

Good Light at Work*

Louis Resnick

PROPER lighting not only averts accidents but leads to more and better work. It decreases mistakes and waste and increases the chances for health and happiness

SCIENTISTS tell us the human eye is simply a protrusion of the brain. More imaginative or romantic persons refer to the eyes as "windows of the soul." Whichever view you take, the fact remains that the eye is not only the most complex organism in the human body, but also the most accommodating organ. The eye can, in a fraction of a second, adjust itself to the most extreme condition—from long range vision to close work—from extreme light to extreme darkness. Because our eyes are so accommodating, because they automatically adjust and readjust themselves many thousand times a day without any conscious effort on our part, and because they may be long overworked before giving any sign of being tired, they are also the most frequently abused organ of the body. Much of this abuse of the eyes may be traced directly to their use under improper lighting conditions.

I think almost everyone will agree that no person can do his work efficiently unless he can see what he is doing, clearly and comfortably; yet you may be surprised to learn that this particular principle of industrial hygiene and business efficiency is being violated every day in thousands of factories, offices and other work places. As a result, many workers suffer from eyestrain—or from one or more of the many disorders which have their root in eyestrain—and industry suffers from decreased production, increased spoilage and errors, increased personal injuries and compensation costs, and lowered plant morale.

* Radio talk over Station WNYC, Thursday, August 25, 1932.

The proper lighting of factories and other work places has always been important from the standpoint of conservation of vision and prevention of blindness, as well as from the purely economic point of view. It is also, however, becoming increasingly important, for two other reasons:

1. The growth of industry and the development of new types of machinery, and its application to ever-increasing numbers of processes, increase continually the number of eye accident hazards to be guarded against. These hazards are decreased to a considerable extent by proper and sufficient illumination.

2. Modern methods of mass production, with their emphasis on speed, often subject the worker to continuous eyestrain. This eyestrain continued over considerable periods of time results in permanent impairment of vision, with the inevitable consequences of increased accident hazards and deterioration of the quality of the product.

Of 50,000,000 electric lamps installed in our industrial plants, less than 25 per cent are so installed or equipped that they will not produce glare. Glare is but one of the defects of industrial illumination. Defective illumination is also one of the principal causes of accidents. The Illuminating Engineering Society estimates that we are losing the services of 125,000 men annually through accidents due to poor lighting. These terms, when translated into dollars, show that industrial accidents caused by poor lighting cost $150,000,000 a year.

That this condition should persist is all the more surprising in view of the fact that investigations by the National Society for the Prevention of Blindness, by the National Safety Council, the American Museum of Safety, the Illuminating Engineering Society, by the lighting industries and by various government bureaus, all show that proper lighting not only averts accidents, but leads to more and better work, and that it decreases mistakes and waste and increases the chances for health and happiness.

And now let me ask and answer the question: "What is good light?"

Any light is good—whether it be sunlight, gas light or electric light—provided there is enough of it; that it is steady; and that it is properly shaded or diffused. No light is good—whether

natural or artificial—if it flickers or is unsteady; if it is of insufficient or of too great intensity; if its source, when on the level with the eye, is unshaded; or if it produces glare.

It is, for instance, just as harmful to read a newspaper on a street car going over a bridge or through the business sections in broad daylight as to read a newspaper in a train if the lights are unsteady. The intermittent lights and shadows thrown across the page by the bridge superstructure or the tall buildings of business districts cause just as great a strain on the eyes as does a flickering artificial light. It is just as harmful to read or do other exacting work with a bright but unshaded light hanging directly before the eyes as to do such work in a dimly lighted room; the muscles of the eyes are strained in either case. Unquestionably, there are thousands of homes, shops, offices, and stores in which people are working either in dimly lighted rooms or with glaring, unshaded gas and electric lights before their eyes.

In the home, proper lighting not only relieves a great deal of avoidable fatigue and thereby makes life happier for everyone, but adds much to the decorative scheme. Probably the worst lighting evil in the home—and it is usually to be found in the work room of the home, the kitchen—is the unshaded electric lamp hanging from a cord in the center of the room or over the kitchen sink. The unshaded light in the kitchen should be replaced by an enclosed lighting fixture close to the ceiling. When this is not feasible or possible, the hanging light should be covered, preferably with a frosted glass shade which will diffuse and reflect all the light and yet keep from view its source, the filament of an electric lamp or the mantle of a gas lamp. Such shades can be bought for as little as 10 cents.

Much of the light by which we see does not come directly from the lamp: it is reflected from ceilings, walls and other surfaces of the room. The better reflectors these surfaces are, the better will be the illumination. In the selection of wall colors and materials, therefore, thought should be given to their light-absorbing and light-reflecting qualities. In the kitchen, where good general illumination is needed, white or other light colored walls and ceilings are desirable.

Few people have become blind wholly as the result of poor

lighting in the home, but the sight of hundreds of thousands of men, women and children has been permanently impaired by long-continued eyestrain resulting from improper lighting in their homes.

The remedies for insufficient light or too much light—gloom and glare, as these conditions are familiarly referred to by illuminating engineers—are usually obvious and attainable with little expense. To avoid gloom, increase the amount of light or distribute it about the room more appropriately so that there will be no dark places where the eyes are to be used for reading or other close work. To avoid glare, shade all gas and electric light so that the filament of the light cannot be seen, and whenever possible read or work with the light falling over your shoulders from the rear; by all means avoid looking directly into an uncovered electric or bright gas light.

Lighting companies today give free expert advice regarding proper lighting of homes, offices, and work places. In most cases, however, a little careful attention to local conditions and the exercise of ordinary common sense will lead to the correction of many lighting defects. Good light helps to make for good sight. Good light is now available at small cost. Sight, on the other hand, is of inestimable value; once it is lost or impaired, it cannot ordinarily be restored. Nothing which serves to safeguard our sight should be considered too difficult or too expensive.

The important things to remember about lighting are these:

Have all lights shaded;
Never read or work with a strong light shining directly into the eyes;
Whenever possible, have the light fall on what you are reading or on your work from above and behind you, or from one side;
If you are not able to read easily with the printed page 12 to 15 inches from the eye, there is something wrong either with the light or with your sight.

Remember that sight is the most valuable of all our senses and that once lost it can never be regained at any price.

Editorial

Heartening Response

IT IS not often that a project toward conservation of vision has as immediate and wide a response as the study of eye accidents in child play, undertaken by the National Society for the Prevention of Blindness. Readers will recall that this report, appearing in the past issue of THE SIGHT-SAVING REVIEW, was based on a questionnaire study of the practices of various states and municipalities regarding the use and sale of fireworks and firearms as toys for children, together with an analysis of eye accidents to children. Following the publication of the report, the same communities were given an opportunity to study it and were asked to consider its recommendations.

Letters of commendation were received from governors and from mayors. Some endorsed the program in letters to the Society and to the press. Requests were received for permission to use the data in radio talks, magazine articles, and for reference reading in class work. The juvenile courts of two of our largest cities asked for information in dealing with problems involving the use of air rifles, etc., by minors. There were requests for assistance in presenting arguments for new ordinances to legislative bodies. One large city, in July, passed an ordinance banning firearms. Several other cities have ordinances under consideration. Many officials asked for copies of a model ordinance. Local newspapers sounded a warning for a "safe and sane Fourth," cautioning against the hazards of fireworks. Quoting from a few responses gives a representative picture.

Hon. A. J. Cermak, Mayor of Chicago, Illinois:

> "I have directed the Commissioner of Police of the City of Chicago to exercise special vigilance at this time in the enforcement of the City's ordinances against the sale of fireworks and the sale and use of prohibited firearms and toys in the nature of firearms. I am also causing a proclamation to be issued to the City of Chicago soliciting their co-operation

in reducing the number of serious accidents from fireworks, air rifles and toy weapons."

Dr. Walter C. Klotz, Director of the Clinic of Cornell Medical College, New York, New York:

"Thank you very much for keeping me on the mailing list in the distribution of the interesting publication regarding blindness of children due to needless accidents. I was very glad to have this additional material in connection with a course of literature at the New York School of Social Work."

Mr. R. W. Sollinger, Alderman, 17th Ward, Syracuse, New York:

". . . I was indeed grateful for the interest shown in your letter and literature forwarded to me which has helped materially to successfully place on the statute books in the City of Syracuse the elimination of fireworks and firearms, with the exception of municipal or organized displays."

Hon. Robert Pfeifle, Mayor of Bethlehem, Pennsylvania:

". . . wish to inform you that the Bethlehem Police Department made special efforts during the past several years to enforce said Ordinance. We have confiscated hundreds of air rifles taken from boys throughout the City, and accidents from said weapons have been reduced to a minimum.

"I note in your letter that the National Society for the Prevention of Blindness has in preparation a model Ordinance dealing with such hazards, and upon completion, will be sent to the legislators of every state and large city in the country. I would appreciate receiving a copy."

Hon. Heber Ermentrout, Mayor of Reading, Pennsylvania:

"I greatly appreciate your letter, together with the marked copy of your SIGHT-SAVING REVIEW which you so kindly sent me.

"I will be only too glad to give this worthy cause all the consideration and publicity it deserves with the hope of impressing the public with its importance."

Mr. Austin J. Roche, Commissioner of Police, Buffalo, New York:

". . . We have an ordinance regulating the use and sale of fireworks, but it is not very stringent. A few days ago I communicated with our Corporation Counsel with a view of

having a more stringent ordinance drawn. I understand that your organization is preparing a model fireworks ordinance, and if so I would be pleased if you would forward a copy to me."

Hon. Frank Doyle, Mayor of East St. Louis, Illinois:

". . . Would further say that our police department will be requested to follow closely your recommendations and try and keep accidents to a minimum."

Hon. R. B. Gautier, Mayor of Miami, Florida:

"I am in sympathy with your proposed ordinance and trust you will send me a copy of it as soon as preparation is completed."

Note and Comment

"Throw Away Your Glasses."—In view of the increasing publicity given to quack doctors and charlatans who advertise special exercises in lieu of glasses, it seems timely to publish several topics from past issues of *Hygeia* which cover the subject so adequately that no further comment or discussion on our part is required.

In answer to a question from a reader, "What is your opinion of eye exercise to correct eyestrain and poor sight?" *Hygeia's* editor supplied the following answer:

> "The rational treatment of poor eyesight and so-called eyestrain depends entirely on the cause of the trouble. If the bad eyesight is due to a malformation of the eye, such as a short far-sighted eye, or a long near-sighted eye, or an oval astigmatic eye, the only exercise that will improve the sight is that involved in lifting a pair of correct glasses on to the bridge of the nose.
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> "All the exercises designed to improve the vision of an abnormally formed eye, with one exception, have been foisted on the credulous public by charlatans. The exception is in children under the age of 6 whose two eyes are not alike and who in consequence have different degrees of vision in each eye. A certain amount of development of the poorer eye may be brought about by exercise. This exercise consists, not in rolling the eye, but in closing off the good eye and forcing the child to use the poorer eye. In a large percentage of cases, the vision in the defective eye can be developed to a fairly high degree, but this cannot be done after the child is 7 years old.
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> "Exercises are of value, not to improve sight, but to relieve certain forms of eyestrain that may be due to an imbalance of the muscles that move the eyes. Each eye is moved in its socket by six different muscles. Between the twelve muscles involved, there is the most delicate balance imaginable, and in certain persons a lack of such balance produces the symp-

toms known as eyestrain. In a small percentage of such cases, the balance can be restored by carefully graduated exercises, carried out over a long period of time. But such exercises should be undertaken only on the advice of an oculist who has made the careful examination necessary and should be controlled by the oculist at stated intervals.

"Beyond these two conditions, exercise of the eye is of no value. When one stops to think that during every waking moment the eye is in constant motion and never rests on any one point for more than eight seconds consecutively, advising eye exercises falls into much the same category as advising a postman to walk for his health."

Another pertinent contribution to this subject, appearing editorially under the title, "Throw Away Your Glasses—A Fallacy," was as follows:

"In the September number of *Hearst's International* appears an article by W. H. Bates, M.D., entitled, 'Throw Away Your Glasses.' The author claims that by exercise of the eyes and of vision, combined with exposure of the eye to intense light, any eye with sight that is imperfect because of an error of refraction may be trained to perfect vision. Almost twenty years ago, according to available reports, Dr. Bates performed some experiments in a laboratory in New York City. The experiments were apparently limited in number, crude in technique, and extremely unconvincing in results. From these experiments Dr. Bates deduced the hypothesis that imperfect sight results from strain of the muscles that move the eyeball within the socket, and consequently all strain and imperfect sight may be relieved by rest and exercise. That this is manifestly an absurdity is patent to anyone with a knowledge of the anatomy of the eye and the laws of light. But the article is written with such an assurant note that it may sound convincing to one who lacks knowledge of the true conditions.

"It is very unfortunate that this article was given publicity. Much harm will be done by the blind acceptance of the dictum, 'Throw Away Your Glasses.' It is no doubt true

that some persons might discard their glasses without harm; but what about the near-sighted children whose nearsightedness, without proper glasses and supervision, will continue to increase to a point approaching blindness? What about the cross-eyed children whose defect could, in many cases, be relieved by proper glasses without resorting to surgery? What about those unfortunate victims of excruciating headaches whose pains are relieved only by properly fitted glasses? What about the patient with serious disease of the eye, manifest to him only by poor sight, whose vision could be saved by timely medical skill, but who is deluded by this article into the belief that his vision will improve with exercise, until it is too late and he is condemned to utter blackness for the rest of his life. That is the sad phase of the publication of such an article of untruths!"

The most recent comment, appearing editorially in *Hygeia*, on eye conservation fakirs, appeared in the current issue, under the title, "Unqualified Practitioners of Healing." It stated, in part:

"Recently there have appeared throughout the United States various concerns for the treatment of defects of vision. Some have been called The American Society for the Conservation of Vision. Thus the promoters have endeavored to conceal the fact that the practices carried on are for profit. Many of these shops have been promoted with the slogan 'Throw away your glasses and have perfect sight.' They have utilized the radio chiefly in securing their patients.

"One of the offices of the American Society for the Conservation of Vision was maintained in Milwaukee under the management of a man named Nickel. To that office came a woman, accompanied by a friend. The manager was introduced as 'Dr.' Nickel, and he undertook various examinations of the eyes of the two women. Then he provided them with charts containing dots and letters to be used as exercises for the treatment of the eyes. An investigation revealed that Nickel was not licensed in Wisconsin to practice either medicine or optometry and that he did not have the certificate of registration required under the Basic Science Act. Wisconsin

is one of the states in which the Basic Science Act provides a minimum standard of education for all who propose to heal the sick. The supreme court pointed out that Nickel had unlawfully treated the sick for a consideration, that the patients who came to him actually had diseases, that the methods which he used could be considered treatment of disease, and finally that Nickel had held himself out as a doctor and had not corrected the impression that he was a physician when introduced in that manner by the office attendant.

"The method which proposes to treat a defect of vision by exercising the eye and by discarding the lenses which have the value of making good the defect is like kicking the crutch from under a cripple who needs it to walk. Sometimes by an extraordinary effort the cripple can proceed without the crutch, but such effort is more likely to injure his weakened limb than to help it."

Accident Reduction in Industry.—Four important factors in the reduction of severity of industrial accidents are: (1) pre-employment physical examinations; (2) periodic physical check-ups; (3) adequate first-aid equipment and education; (4) competent medical attention. These four factors are particularly important in preventing eye casualties. Through pre-employment examinations in one organization, it was found that twenty per cent of the applicants were rejected on physical grounds, one-third of whom could not be considered for employment because of visual defects. Dr. J. J. Wittmer, writing for the July *National Safety News*, says, "Defective vision is not only a distinct hazard to the employee himself, but under many conditions, a menace to others." A rule which, stringently enforced, will prevent a large amount of visual impairment, is that which requires a complete ophthalmic examination after every eye injury, no matter how apparently trivial.

Medical Social Eye Service at the Presbyterian Hospital.—The practical importance of social work in connection with eye clinics is seen in the brief report of the social service department of the Presbyterian Hospital in New York City. During the past year, 823, or 11 per cent, of the clinic patients needed and benefited by

consultation with the social service worker assigned to eye service. The ramifications of eye problems extend in a widening circle through health, economic, educational and vocational agencies, with whom the medical social worker co-operates to assist the patient.

Prevention of Blindness in Certification of the Blind.—In the report on the work of the Glasgow Clinic for the certification of the blind, the interrelation between expert ophthalmic certification and the prevention of blindness is clearly brought out. In a statistical study of the causes of blindness registered and examined by the certifying board, it is seen that congenital and unknown causes of blindness are most prevalent. Under this head are included myopia, cataract and glaucoma; while the incidence of these eye diseases cannot be entirely prevented, early treatment may do much to conserve sight. Infectious and toxic diseases are next in importance, and accidental injury is the last category. The preventive aspect of such certification is seen in the case of 168 patients who had never before had skilled examination or treatment; of these, a substantial number could have had some sight saved had early treatment been instituted.

Headlights, An Unsolved Problem.—Although recently published statistics show that more automobile accidents occur in the late afternoon on clear, dry days than at any other time or under any other conditions, all drivers of cars will agree that their nervousness increases with night driving, when the glare of oncoming headlights makes road visibility problematic. William S. Canning, writing for the June issue of the *Keystone Motorist*, says that, while cars are becoming more mechanically reliable and road conditions safer, the headlight question has not advanced materially in the past ten years. No known headlight will penetrate fogs; while glare may be eliminated by having the headlights in perfect adjustment—perfectly aligned and the lamps at the exact focal point on the reflector—any maladjustment of the lamps or reflectors and any irregularity of the road surface will disturb this delicate balance and cause glare. The United States Bureau of Standards has made a study of headlights, with the following conclusions: the average headlight, horizontally thrown,

permits a visibility as far as three hundred feet ahead; when a car is coming from the opposite direction, the headlights from the oncoming car cut the road visibility to one hundred feet ahead; glare from opposing headlights is almost inevitable, and causes a momentary blindness. This blindness increases when the opposing headlights are of greater candlepower than those of the first car; frequent checking of the alignment of headlights is the only method of preventing excessive glare.

Preventing Blindness in Russia.—Along with the vast project of industrialization in Russia, and in many ways necessary for its success, is the program for the improvement in health and hygienic standards throughout the country. Current periodicals have shed considerable light on what is being done in that enterprising country for the prevention of blindness. According to Ida M. Cowley, whose visit to Russia is reported in the *New Beacon* for June 15, the latest census, dated 1926, gave the blind population as close to a quarter of a million,* 12.6 per cent of whom had been born blind. Glaucoma, trachoma and smallpox are the important causes of blindness in Russia, and it is considered that, conservatively speaking, 60 per cent of the blindness is preventable. An optimistic note is sounded in the report that blindness among children has been greatly reduced in the years from 1926 to 1930.

Russia is inquiring closely into industrial eye accidents. At the first All-Union Conference on Problems of Medical Expert Opinions of Disability, held in Narkomzdrav in 1928, a paper on "Some Problems in the Expert Examination of Eye Defects" shows the thoroughness of Russian industry's determination to protect the worker. The eye is studied in its six functions: visual acuity for far and near, peripheral, binocular and color vision, and light sense. Tables determine the loss incurred with an accident, and compensation is based upon these calculations and a careful analysis of the visual requirements of the worker's occupation; progressive myopia among those who perform close-vision tasks is considered an occupational disease.

Therapeutic measures for the prevention of blindness are also being studied, according to a note in the *Journal of the American*

* The 1931 census shows a blind population of 234,833.

Medical Association for July 23. Professor W. P. Phylatov of Odessa reports a technique for transplanting the cornea as a measure for the prevention of blindness.

The public health project for the second Five Year Plan is also reported in the *Journal*, and it may be interesting to know that this plan must completely abolish industrial accidents; that there will be an end to the so-called social diseases: typhus fever, typhoid, variola, trachoma, malaria and, partially, syphilis. In the socialistic town there will be no place for the development of rheumatism, tuberculosis, venereal diseases, or epidemics.

Prizes in Ophthalmology.—The prizes of 2,000 Swiss francs, for original work on the etiology of trachoma, offered a year ago by the Hungarian Minister of Public Welfare and Labor, have been awarded to Dr. Ugo Lumbroso, Tunis, and Dr. J. Taboriski, Palestine. Honorable mention was given to Drs. Cattaneo, Sassari; P. Olitsky, New York; Rotth and Kanyo, Budapest; and C. Trapezontzewa, Moscow.

The Fiske Fund prize has been awarded this year to Dr. Harry C. Messinger for his paper on "The Value of Ocular Signs and Symptoms in the Diagnosis of General Disease."

State and Provincial Health Authorities Issue Proceedings.—In the recent publication of the proceedings of the 1931 annual meeting of the Conference of State and Provincial Health Authorities of North America is found a summary of the work of the Committee on Conservation of Vision, recalling the contributions of this body to the White House Conference on Child Health and Protection, to the first Mexican Congress for the Prevention of Blindness, to the meeting called by the Secretary-Treasurer of the Conference, for a discussion of control of wood alcohol, and to the study now under way on the efficiency of silver nitrate.

Better Mine Lighting.—Higher standards of mine lighting have been proposed by the Mines Department of Great Britain, which, according to the American Standards Association *Bulletin*, exceed those of 1912 by about thirty per cent. The Safety in Mines Research Board and the British collieries are seeking to fix a higher lighting standard for new safety lamps, and to provide for gradual

displacement of the inferior lamps now in use; to require better maintenance practice in the colliery lamp rooms; to investigate the possibilities of extending the main lighting system to actual working faces, where possible; and to recommend the use of white or light-colored dust for rock-dusting mine workings, and to promote the practice now growing of whitewashing stations, pump rooms, haulageways, etc.

George Strong Derby Memorial.—In memory of the late Dr. George Strong Derby, a fund has been established and contributions are being received at the Massachusetts Eye and Ear Infirmary. Income from the fund will be used to carry on projects in which Dr. Derby was particularly interested. At present, the services of a social worker caring for glaucoma patients are being made available, partially by the fund.

Finding Sight Defects in Young Children.—Dr. Eva L. Roberts, assistant school medical officer, in England, has made a study of vision testing of school children which may prove to be revolutionary, according to a note in the May 28 issue of the *Medical Officer*. After an eye test with the Snellen chart, she recommends repeating the test with a plus-one-diopter sphere, held before the reading eye. Because 80 per cent of children are hyperopic, they will find the sphere an added comfort in seeing; those with so-called emmetropic eyes and those with a mild myopia will show a markedly lessened visual acuity, a danger sign of approaching myopia. This defect may then be corrected before it progresses to a more menacing point.

Home Lighting Problems Studied.—The General Electric Company at Nela Park, Cleveland, held a four-day institute on home lighting practice, from August 29 to September 1. Among the topics covered were: Seeing, Conserving Vision Through Better Home Lighting, and The Fundamentals of Lighting. Celebrating its twenty-sixth annual convention, the Illuminating Engineering Society will meet from September 27 to 29 at Swampscott, Massachusetts, to devote the major portion of its program to the study of lighting practice. Particularly interesting will be the laboratory session, at which M. Luckiesh and F. K. Moss will talk on "The Human Seeing Machine."

Ophthalmic Examinations.—The examination of the American Board for Ophthalmic Examinations will be held Monday, September 19, 1932, at Montreal, at the time of the meeting of the American Academy of Ophthalmology and Oto-Laryngology.

Cornell Clinic Moves.—The Cornell Clinic for persons in moderate circumstances will again open its doors on September 1, at the new medical center at York Avenue and Seventieth Street, New York City. The services of this clinic, which has been serving the people of New York for some ten years, will be merged with the out-patient service of the New York Hospital.

Prenatal Neglect is Seen After Eighteen Years.—The importance of early care of expectant mothers as a measure of blindness prevention is seen in the account, given by Noble Black in the May issue of the *Canadian Public Health Journal*, of a young woman who married and subsequently bore two children. Two years ago, the oldest child, at eighteen years of age, was found to be approaching blindness, due to congenital syphilis, while her sister, sixteen years old, is rapidly becoming a mental defective from the same cause. Routine Wassermann tests of every expectant mother would rule out such tragedy as this mother, herself innocent, inflicted upon her unborn children.

Ophthalmia Neonatorum Becoming Rare in England.—At the summer session meeting of the General Council of Medical Education and Registration of Great Britain, in a discussion of teaching diseases of the eye, it was noted that ophthalmia neonatorum cases are becoming rarities in general hospitals in England. In one district in London, Mr. Bishop Harman said, there had not been a case of ophthalmia neonatorum for several years. Those few cases that occur are immediately isolated in special hospitals, where the general medical student has little contact. Since ophthalmia neonatorum must be seen at first hand to understand its symptoms and treatment, the section on ophthalmology recommends that the study of this disease be undertaken at the same time as the study of fevers, as it is in hospitals for the latter that ophthalmia neonatorum patients are generally isolated. The consistent reduction in the number of cases of this disease leads

those interested in prevention of blindness to foresee the day when there will be no cases to be seen, and ophthalmia neonatorum will have become indeed a medical legend.

The Blind in Spain.—To the visitor in Spain remains the memory of blind beggars, blind street singers, blind lottery vendors, who haunt the main thoroughfares seeking coppers, and of the many more sightless of all ages who crouch apathetically in corners of public buildings, taking what charitable crumbs fall their way. The omnipresence of blind of all ages is explained by the late Dr. Miguel de Mérida Nicolich in the June issue of *And There Was Light*, published by the American Braille Press. Dr. Nicolich was the motivating force in Spain for care and education of the blind, as well as for prevention of blindness.

According to rough figures, 13 per cent of the Spanish blind are children under 16 years of age; 91 per cent of them are needy. Lack of homes and schools for the blind leave only begging and street selling open to these unfortunates as a means of livelihood; 93 per cent of the blind in Spain are illiterates. The percentage of blind in Spain is higher than in any other European or American country; there is one blind person to every 826 of population, or about 38,000 blind. Among the preventable causes of blindness are: ophthalmia neonatorum; gonorrheal ophthalmia; syphilis of the eye; trachoma, today as great a menace to Spaniards as it was when Napoleon's army brought the Egyptian scourge to Europe. Roughly, 70 per cent of the blind in Spain need not have been so.

The inadequacy of educational and training facilities for the blind in Spain, the lack of vocational training, and the disregard for any precautions to prevent blindness were seen and provided for in Dr. Nicolich's program for aiding the blind. That his death occurred at a time when a new government and a new freedom from religious supervision might have incorporated his program in the national progress was a blow to the blind. It's to be hoped that his interest, enthusiasm and foresight will be carried on by his friends as his memorial to the blind in Spain.

Trachoma in Manitoba.—A survey made in Manitoba in 1930 revealed that approximately one in every ten persons in the so-

called trachoma district showed symptoms of trachoma. In an effort to cure and prevent the spread of the disease, a traveling clinic is held in the infected areas, under the supervision of Dr. E. H. Alexander, an ophthalmologist, who has recently returned from study in Europe of methods of trachoma control. A recent report shows that from September to May of the past year over 2,000 visits were made to the clinic and 446 cases of trachoma identified and treated.

Chicago Abandons School Physical Examinations.—Health examinations of school children, long acknowledged by health authorities as the great field for preventive medicine among a portion of the population most susceptible to preventive handling, have been abandoned in Chicago. This results from the failure of the city to renew its appropriation for the maintenance of twenty-five school physicians and nurses. While some children receive medical attention and examination privately, the larger portion do not have physical examinations nor medical care except in emergencies. This action in Chicago is a setback in the campaign for early detection and correction of physical defects.

Lincoln's Eyes.—Physical characteristics play an important part in the determination of character and actions. A series of articles, "Lincoln and the Doctors," which is appearing in *Hygeia*, analyzes the physical history of Lincoln and explains many of his traits in terms of his physical condition. Particularly interesting is the chapter in the June issue, in which Lincoln's eyes are under discussion. We learn that Lincoln did not wear glasses until, when he was forty-seven, he "kinder needed spectacles," and made his selection from a tray of mixed spectacles. Much of the sadness of Lincoln's expression, says Dr. Milton H. Shutes, the author, was due not only to his sympathy with the sorrows of his people, but also to the fact that his left eye had a marked deviation from the right. Ordinarily, the eyes were brought into fusion but, on one occasion, Lincoln, wakening from a nap, saw a double vision of himself in a nearby mirror. His wife diagnosed the apparent apparition as a prophecy that he would be re-elected to the presidency, but that he would not outlive his second term. Ophthalmology has a more rational explanation: in his complete relaxa-

tion, his eyes, which usually made the necessary effort to function together, were working independently for a few seconds.

Child-Welfare News Summary Suspended.—To those in the field of child welfare and child health, the news that the *Child-Welfare News Summary*, published weekly by the Children's Bureau of the United States Department of Labor, is to be suspended for reasons of economy will be a matter of regret. This publication, which has summarized and abstracted books, articles and news, in the field of child welfare, has been of great assistance in evaluating and calling attention to articles in the American and European literature. The Children's Bureau hopes to prepare similar abstracts and reviews for occasional publication, so that this service, while curtailed, will not be entirely unfulfilled.

Making Silver Nitrate Foolproof.—The use of silver nitrate for the prevention of ophthalmia neonatorum is now practically universal, but it is by no means certain that the present methods of preparation of the solution or of its storage are ideal. For this reason, the Standing Committee on Conservation of Vision of the Conference of State and Provincial Health Authorities of North America, for which the National Society for the Prevention of Blindness provides the secretariat, is sponsoring an inquiry on silver nitrate, its preparation, storage and reactions to time and light. The most recent report of the investigation shows that beeswax is unsatisfactory as the ampule container; glass, eliminated because of the danger of breakage, also fails to prevent chemical changes in the solution when stored for a short time. Ampules composed entirely of hydrocarbons show a degree of stability which is now leading to a search for the ideal material of this nature for the storage and distribution of silver nitrate.

Ohio Regulates the Use of Fireworks.—A law limiting the sale, storage and use of fireworks has gone into effect in Ohio this year, according to a note in the *Ohio Health News*. Certain types of fireworks and toy explosives are prohibited, and others are limited in use. The note adds, "Moreover, in this time of economic depression, it would seem the part of good citizenship to devote the family funds to the things that are essential, rather than something

which dissolves in noise, smoke and smell, and may leave horrible death in its train."

Canadian Sight-Saving Class Teachers' Exchange.—Under the leadership of the prevention of blindness department of the Canadian National Institute for the Blind, a mimeographed periodical devoted to the interests of Canadian sight-saving class teachers has been inaugurated. The first issue, which appeared in June, carried a lively article on a sight-saving class in Montreal, as well as news of interest to teachers of partially sighted children. A second number will appear in October.

Eye Muscle Training Class.—The value of ocular muscle training for children with convergent squint is being demonstrated in Westchester County by the prevention of blindness department of the New York State Commission for the Blind. The present classes in White Plains and Tarrytown, with 25 pupils, ranging in age from 3 to 15 years, are to continue for four months; already improvement in fusion and vision is noted among the individual pupils. Miss Elizabeth K. Stark, who was technician in charge of the exercises, has concluded her work in order that she may visit the Maddox Clinic in England. Her place is taken by Miss Dorothy Behner, who plans not only to work with the classes, but to visit the individual homes further to gain the co-operation of the parents. Dr. Park Lewis writes: "The subject of the training of muscular imbalance and the development of amblyopic eyes is one I feel sure ought to receive more study than has been given it."

Improved Ophthalmoscope.—With the invention of the ophthalmoscope, seventy-five years ago, Helmholtz made possible the science and art of ophthalmology, which have advanced in such strides since his time. At the recent meeting of the American Medical Association in New Orleans, Dr. Jonas Friedenwald of Baltimore exhibited a refinement of the Helmholtz ophthalmoscope which will make possible the early discovery of diseases through eye symptoms, as well as the prompt recognition of diseases of the eye itself.

Trachoma Virulence in the United States.—According to a report in the *United States Public Health Reports* for May 20, while

there are nearly five times as many cases of trachoma in Kentucky as in Missouri, there is 150 per cent more blindness from this cause in Missouri than in Kentucky. Tennessee, which has 200 more cases than Missouri, has one-eighth the amount of blindness. No reason can be advanced for the difference in the virulence of the disease among people of relatively the same economic background.

Should Children Wear Glasses?—This question, which is answered thoughtfully by Dr. William H. Crisp in a recent number of *Colorado Medicine*, is one which is echoed by parents everywhere, particularly when there is question of eye difficulty in their own children. Dr. Crisp finds that children with visual defects should have glasses as soon as the defect is noticed; the slight handicap of glasses in play activities is more than compensated for by the help these same glasses give the intelligent child who would be unable with an uncorrected defect of vision to make the most of his opportunities at school. The fact that with drops and through subjective tests the eyes of very young children may be accurately measured should make physicians insist that all young children needing glasses wear them.

New Italian Journal of Ophthalmology.—A new journal, *Rassegna Italiana d'ottalmologia*, devoted to ophthalmology, has been initiated under the editorship of Professor L. Guglianetti of the University of Turin. Carrying original papers, reviews, abstracts and news in the field of ophthalmology, the magazine will appear monthly, or in a double issue bimonthly. That this is the fourth journal devoted to ophthalmological interests shows the activity now current in Italian clinics.

Prevention of Blindness in England.—Since blindness may have different causes in different communities, the Prevention of Blindness Committee of the Union of Counties Associations for the Blind, in England, is beginning with the blind themselves in their efforts to prevent loss of sight in the future. Following the Scottish system of certification of blind persons, the Committee recommends that everyone on the blind register be examined by competent ophthalmologists for the type of blindness and the initial cause of the condition. From this basis of the causes of

blindness, a thorough-going prevention program can be worked out to eliminate such causes in the future.

Spectacles Win.—That slight eye defects may have a great importance in our daily activities is the theme of a story by Dr. Henry G. Langworthy in the August issue of *Hygeia*. A lad whose drive off the tee was a "natural" was unable to sink his putts; a slight astigmatism and a sensitivity to light made it impossible for the player to get a line on the ball on the green. After correction of his eye difficulties, his putting fulfilled the promise of his drives, and the after-game headaches from eyestrain also disappeared.

Value of Physical Tests in Vocational Guidance.—It has been customary to consider aptitude tests and educational achievement tests part of any vocational guidance plan, but in France, where all pupils in technical schools are thoroughly examined, a complete physical test has proved valuable in placing young people in occupations. In one group of 146 pupils, 63 were found to have subnormal vision; many of these cases of eye difficulty were unknown by the pupils. Other physical reasons for changing occupational direction were tuberculosis and hyperhidrosis of the hands.

Eye Service in State Medicine.—Under the National Health Insurance Act in England, the insured person was entitled to ophthalmic service either from an ophthalmologist or a sight-testing optician. Naturally, because of the lower fees of the sight-testing optician most patients were sent to him. A recently organized National Ophthalmic Treatment Board recognizes the need for more than eye refraction in treatment of the eyes and, accordingly, has made provision, under the National Health Insurance Act, for those unable to pay private ophthalmic consultation fees. This move serves as a special protection for those whose symptoms may be impaired visual acuity, but whose difficulty lies in a deeper systemic involvement.

Is There an Optimum Line-Length in Reading?—Most of the pronouncements on the best length of line for reading have been arrived at arbitrarily, says Arthur I. Gates in the *Journal of Edu-*

cational Research for January, 1931. A controlled study showed that readers tend to accustom themselves to a particular length of line, but a group who had been presented with lines varying in length between four and ten inches read both extremes and the average lines with equal ease. He concludes, therefore, that additional evidence is necessary before standards can be adopted with full assurance of their validity.

Trachoma in the Argentine.—Trachoma has attained alarming proportions in the Argentine, according to Dr. Antenor Alvarez, who describes the demonstration for the prophylaxis of trachoma being made by the Argentine Red Cross and the Anti-Trachoma League at Santiago del Estero. Here, among the school children, an incidence of 14.72 per cent was found, and in the suburban schools it rose as high as 35 per cent. Efforts of those in charge of the demonstration are directed to encourage the state to take over the work of combating trachoma throughout the country and to improve the general living conditions and hygienic standards of the nation as a whole.

Special Education in Michigan.—Although the enrollment for special classes (for children who are crippled, deaf or hard of hearing, blind or partially sighted) in Michigan has increased during the past year, and supervisory services have expanded, the cost per capita of maintaining these classes has dropped, according to the annual report of the Division of Special Education of the Department of Public Instruction of the state of Michigan. One development in the effort to give handicapped children opportunities equal to those of their more fortunate brothers has been the move to return to the regular grades those children whose condition has been improved or stabilized to such an extent that they may profit from instruction with the regular grades.

Illumination, An Essential Requirement in Modern Plants.—Because of his eyesight, man continues to be more important in the producing world than the machines that seem to claim so many of his previous occupations. In the coal preparation plant, the sharp eyes of man are needed to grade the coal, yet, according to J. H. Edwards, in the August issue of *Coal Age*, a study of a new coal

producing plant showed that the illumination over the picking table was between one-and-a-half and two-and-a-half foot-candles —insufficient light for accurate seeing. Mr. Edwards finds that lighting is poor because the ease of its installation encourages the postponement of its planning until after the plant is built; then it is considered incidental, rather than one of the basic requirements of a good plant.

Books for Bed.—Many of us can recall the time, not so long ago, when reading in bed was frowned upon as hard upon the eyes and bad for the character. Today, it is recognized that a short period of reading is conducive to sound sleep, and the custom is so prevalent that the bedside book is receiving special study. The perfect bedside book, says William Lyon Phelps, in a recent issue of *Scribner's*, should be entertaining in content, without being exciting or stimulating. Physically, it should be light in weight, with dull paper, and printed in as large a type as possible. For full protection of the eyes, the National Society for the Prevention of Blindness recommends that bed-readers sit up to read with an adequate light coming from behind and above the head.

New Cinema Theatre Eliminates Eyestrain.—The old legitimate theatre was built with the idea that the front seats, nearest to the stage, were the most desirable, and the other seats were arranged in graduating upward tiers, to compensate, to some extent, for their distance from the scene. The opposite of this is true for motion-picture theatres, for the best seats are those in the center and back, while the front seats are so close that the picture is out of focus to those seated there. A new cinema theatre, built in New York City, has considered the perfect focusing of the picture from every seat in the house, and accordingly has built a parabolic floor, on which the front seats are somewhat raised for better vision.

National Society Notes.—The National Society for the Prevention of Blindness co-operated actively this summer, as in previous years, with universities giving summer courses for training sight-saving class teachers. Mrs. Winifred Hathaway, associate director of the National Society, served as special lecturer at Teachers College, Columbia University, New York City, in the course for

training sight-saving class teachers. Mr. Lewis H. Carris, managing director of the National Society, lectured to this group, as well as to sight-saving class groups at the University of Cincinnati, Cincinnati, Ohio, the University of Chicago, Chicago, Illinois, and State Teachers College, Buffalo, New York.

Mr. Carris participated in the thirty-first biennial meeting of the American Association of Instructors of the Blind. He spoke on "How May Our Schools Assist in the Prevention of Blindness?" and, at the evening session, on "One Hundred Years in the Education of the Blind." At the request of the National Rehabilitation Association, he will act as chairman of a session of its annual conference, on Co-ordination and Co-operation of Allied Organizations, to be held during its annual conference, October 9 to 12.

A series of radio talks on eye health, given with the co-operation of the New York Tuberculosis and Health Association, was broadcast by staff members of the National Society. Miss Eleanor P. Brown, secretary of the National Society, spoke on "To See or Not to See"; Miss Mary Emma Smith, director of nursing activities, gave the warning, "Prize Your Eyes"; Miss C. Edith Kerby, statistician, spoke on "Facts about Glasses"; Mr. David Resnick, director of publicity, talked on "Your Foresight Guards Their Eyesight." Co-operating with the New York State Department of Labor, Mr. Louis Resnick spoke on "Why It is Important to Have Good Light at Work."

Demonstrations of preschool vision testing were made by Miss Smith before students in summer schools at Teachers College, Columbia University, and New York University, New York City; The Johns Hopkins University, Baltimore, Maryland; Rutgers University, New Brunswick, New Jersey; Trenton State Teachers College, Trenton, New Jersey; and at Hyannis State Normal College, Hyannis, Massachusetts. Miss Smith also represented the Society at the annual meeting of the Conference of State and Provincial Health Authorities of North America, held in Washington, District of Columbia. Her plans for the coming season include participation in the Twenty-first Annual Safety Congress, at Washington, D. C., October 3–7. She was invited to present "The Contribution of the Nurse to the Conservation of Eyesight," during a joint meeting of the Industrial Health Section with the Industrial Nursing Section.

We are pleased to announce that Dr. E. V. L. Brown, of the Department of Surgery, University of Chicago, and member of the Board of Editors of THE SIGHT-SAVING REVIEW, and Dr. Le Grand H. Hardy, director of eye service at the Fifth Avenue Hospital, New York City, have recently accepted appointments as members of the Advisory Committee of the National Society.

Current Articles of Interest

The Etiology of Strabismus, Ralph I. Lloyd, M.D., *Archives of Ophthalmology*, June, 1932, published monthly by the American Medical Association, Chicago, Ill. The essential feature of human binocular vision is double retinal and double cortical representation, and, when this is lacking, diplopia results. The disparity of macular capacity has not been given the prominence that it deserves as a factor in squint, in the author's opinion. While muscle balance may be the cause of some slight cases of squint, the writer believes that the conflict of images takes place in the brain, and the most important prerequisite to the formation of a single image is approximately equal visual acuity.

The Trachoma Problem, F. D. McKenty, M.D., *Canadian Public Health Journal*, May, 1932, published monthly by the Canadian Public Health Association, Toronto, Canada. Although Canada is relatively little affected by the trachoma problem, the infectiousness of the disease and its serious prognosis when untreated make it a question of vital importance wherever a single case exists. The author reviews the trachoma problem—its distribution in all parts of the world, its probable etiology, its treatment and prognosis, and the measures which may be taken to prevent its spread.

Aberrations of Eyes and Lenses, Edward Jackson, M.D., *Journal of the American Medical Association*, August 6, 1932, published weekly by the American Medical Association, Chicago, Ill. A description of the irregularities of the eyeball, in relation to correcting lenses, leads to a plea for more careful prescribing and fitting of correcting lenses so as to eliminate the aberrations of eyes and lenses.

The Education of the Partially Blind, E. A. Whitfield, *New Beacon*, May 15, 1932, published monthly by the National Institute for the Blind, London, England. The elasticity of the definition of blindness in England permits partially blind children to be educated with and in the same manner as wholly blind children. This relatively small group of children (estimated in England as

about 7,000) cannot compete with normally sighted children in regular grades, while the type of education suited to the blind is totally unfitted to their needs. The problem of ideal education for these children still remains to be solved, although the path of instruction has been mapped out.

Changes in the Eye After Feeding Animals with Altered Vitamins, O. Katayama, *Acta Jap. Opth. Soc.*, September, 1931, abstracted in the *Archives of Ophthalmology*, June, 1932, published monthly by the American Medical Association, Chicago, Ill. The author conducted a number of experiments on rabbits, feeding them with beans heated to 120 and 130 C., thus altering the vitamins. He found (1) the cornea presented pathological changes and part of the epithelium desquamated and was destroyed; (2) the retina showed changes after thirty-five days; (3) the optic nerve presented marked changes. The longer the experiments were tried, the more marked were the resulting symptoms.

The Medical Examination of Domestic Servants, Charles V. Craster, M.D., *Public Health News*, May–June, 1932, published monthly by the Department of Health of the State of New Jersey, Trenton, N. J. An account is given of the work being done under the auspices of the Newark Department of Health in medical examination of domestic servants, similar in scope to that for general food handlers, to safeguard those in the home from contact with tuberculosis, typhoid, venereal disease, and other communicable diseases.

Notes on Muscle and Fusion Training and Orthoptic Treatment of Motor Anomalies, Otis Wolfe, M.D., *American Journal of Ophthalmology*, July, 1932, published monthly by the Ophthalmic Publishing Company, St. Louis, Mo. The author describes a series of cases in which a functional element was the causal factor in producing nervous conditions and symptoms of eyestrain. Orthoptic exercises along with other treatment are therapeutic measures of merit, producing direct retinal and cerebral stimulation, along with an unmeasurable amount of psychic effect.

Asthenopia, a Psychoneurosis and a Medical Responsibility, C. W. Rutherford, M.D., *Journal of the American Medical Asso-*

ciation, July 23, 1932, published weekly by the American Medical Association, Chicago, Ill. The author finds that a close relationship exists between disorders of the nervous system and of the eyes. Many patients, complaining of eyestrain, show no refractive errors, or extremely slight deviation, yet they need the greatest attention from the ophthalmologist, who can make their vision comfortable and dispel, to some extent, the psychoneurosis. The paper emphasizes the fact that refraction is no mechanical performance, but an art practiced upon the whole patient.

The Industrial Ophthalmological and Compensation Problem, J. Guy Jones, M.D., *Texas State Journal of Medicine*, July, 1932, published monthly by the State Medical Association of Texas, Fort Worth, Texas. In reviewing the problems of industrial compensation for ophthalmological injuries, the writer finds that labor is receiving good medical treatment in the majority of cases, although compensation might be greater. Because of the feeling of mistrust between the insurance company and the injured, a full physical examination before employment would rule out much unfairness on both sides.

Nasal Sinusitis and the Eye, E. Watson-William, F.R.C.S., *Lancet*, July 9, 1932, published weekly by The Lancet, Ltd., London, Eng. Case reports of patients whose eye difficulties did not improve until after treatment of the sinus infection show the importance of early study of sinus conditions in stubborn eye cases.

New Data on the Typography of Textbooks, B. R. Buckingham, *Thirtieth Yearbook of the National Society for the Study of Education*, 1931, published by the Public School Publishing Company, Bloomington, Ill. Limiting his research to defining the ideal typography for early readers, the author finds that the school administrator must consider the ideal type and set-up not only from the point of view of readability, but also from the angle of the purchaser of books. The correlation between readability and production costs is shown.

Manuscript Writing, Jennie Wahlert, *Childhood Education*, June, 1932, published monthly by the Association for Childhood

Education, Washington, D. C. After a seven-year period of observation, the writer finds that manuscript writing, particularly for beginners in reading and writing, is an easier medium of expression than cursive, that the children using manuscript writing improve in legibility more rapidly, and that there are no writing failures under this system.

Monocular Cycloplegia for the Control of Myopia, W. H. Luedde, M.D., *American Journal of Ophthalmology*, July, 1932, published monthly by the Ophthalmic Publishing Company, St. Louis, Mo. If convergence of the eyeballs during close work is one of the conditions conducive to myopia, the relief from the necessity of such convergence should prove a check to the myopia. Based on this hypothesis, case records over an eight-year period show that myopia was treated through monocular cycloplegia over intervals, resulting in arrest of the condition.

The Ophthalmologist and the Lighting Problems of His Patients, Walter B. Lancaster, M.D., *Archives of Ophthalmology*, July, 1932, published monthly by the American Medical Association, Chicago, Ill. Poor lighting may be divided into two classes: that which is obviously insufficient or lacking in one way or another, and that which might suffice for the strong, healthy eye, but causes conjunctivitis and other disagreeable symptoms in weaker eyes. The ophthalmologist, to be of greatest service to his patients, should recognize poor lighting and understand the problems of lighting sufficiently to be able to help his patients correct their home lighting environment. This article is a comprehensive and concise statement of the lighting problem applied to everyday life.

There is Only One Side to the Goggle Question, Harry Guilbert, *National Safety News*, April, 1932, published monthly by the National Safety Council, Chicago, Ill. The responsibility for complete eye protection rests with the executives of any plant, says the safety director of The Pullman Company, and, where the wearing of goggles in all parts of the plant is mandatory, the ruling applies equally to the president of the company and to the newest workman. When the wearing of goggles at all times, by everyone, is enforced, there is no danger of eye accidents. Men will more

deeply appreciate the need for wearing goggles when the enthusiasm for eye protection comes from the president, the executives, the directors and the foremen.

Vitamin A, Lafayette B. Mendel, *Journal of the American Medical Association*, June 4, 1932, published weekly by the American Medical Association, Chicago, Ill. The first of a series of articles on present-day knowledge of vitamins, this paper traces the history of the recognition of vitamin A, the characteristics manifested when it is absent from the diet, its incidence in foods and its function. Lack of this vitamin will cause ophthalmia in young rats, which it will cure when restored to the diet. Vitamin A is found abundantly in butter, cream, milk, eggs, cod liver oil, carrots, spinach and watercress.

A Century of Service: The Story of the Wills Eye Hospital, Madelin Blitzstein, *Hygeia*, August, 1932, published monthly by the American Medical Association, Chicago, Ill. On the occasion of the one-hundredth anniversary of the Wills Hospital and its move to a modern building, it is timely to look back over the history in ophthalmology which this institution has made in the past century.

Glareless Lighting for Hospital Wards, C. E. Ferree and G. Rand, *Modern Hospital*, June, 1932, published monthly by the Modern Hospital Publishing Company, Chicago, Ill. In a study of the problem of hospital lighting, the writers have found that ceiling fixtures should illuminate the working plane with a comfortable distribution of brightness in the field of view; such fixtures should shield the eye from glare; the beam which comes from the ideal ceiling fixture directly upon the working field should be diffused. Descriptions and drawings of an ideal ceiling fixture, with bright-light and twilight attachment, are given.

Handwriting, Frank N. Freeman, *Review of Educational Research*, December, 1931, published five times a year by the American Educational Research Association, Washington, D. C. Reports of educational and psychological studies of children's handwriting, discuss the relative merits of manuscript and cursive

writing, the relationship between mirror writing and left-handedness, and writing abnormalities.

Inexpert Refraction, John Green, Jr., M.D., and Carl Beisbarth, M.D., *Journal of the American Medical Association*, July 9, 1932, published weekly by the American Medical Association, Chicago, Ill. The eye, as the organ of vision, must see accurately, and this paper makes a plea to ophthalmologists for conscientious, careful refraction for visual defects. Technics and procedures for refraction of the eyes, at all ages, are clearly outlined.

The Mechanism of Vision. V. The Structure and Image-Forming Power of the Rat's Eye, K. S. Lashley, *Journal of Comparative Psychology*, April, 1932, published bimonthly by the Williams and Wilkins Company, Baltimore, Md. While previous studies of the vision of rats suggested that visual acuity was almost lacking, this investigation shows that the rat has a fairly effective detail vision, with an acuity about one-fiftieth to one-twenty-fifth that of man, and ability to discriminate complicated patterns above this threshold. Reviewing the results of the present study, we find that the eye represents a fairly efficient optical system, conforming in its possibilities to the actual findings in recent tests of visual discrimination.

Trachoma and Trichiasis Among the Greeks, A. Gabriélidès, *Revue Internationale du Trachome*, April, 1932, published quarterly by the League Against Trachoma, Paris, France. Trachoma, an eye disease known and written about by Egyptian ophthalmologists, was an important eye disease among the Greeks. Although the Greeks had no ophthalmic specialty in medicine, they surpassed the Egyptians in their knowledge and skill in curing eye diseases, and their literature tells of the symptoms, the frequency, the cause (it is interesting to note that they felt that trachoma came from dust, smoke and irritating vapors), and the treatment, much of which is still practiced.

Researches on the Follicular Diseases of the Conjunctiva, Prof. Dr. C. Pascheff, *American Journal of Ophthalmology*, August, 1932, published monthly by the Ophthalmic Publishing Company,

St. Louis, Mo. Follicular disease of the conjunctiva is classified, and, from clinical and histological characteristics of each form of the disease, four laws of trachoma are formulated: (1) there is no trachoma without follicles; (2) the trachoma follicle is confluent; (3) the folliculoma of trachoma can develop on the conjunctiva as well as on the cornea; (4) true trachoma finally passes into spontaneous cicatrization or hyaline degeneration. The conclusion is drawn that trachoma is an endogenous disease, characterized by constitutional lymphadenoid vegetation of the conjunctiva.

Clinical Features of Vitamin A Deficiency, George B. Eusterman, M.D., and Dwight L. Wilbur, M.D., *Journal of the American Medical Association*, June 11, 1932, published weekly by the American Medical Association, Chicago, Ill. A study of vitamin A from compiled literature on the subject shows its nature and sources, and the effect of a diet, continually deficient in this essential food factor, upon the eyes, the respiratory tract, the alimentary tract, etc. Treatment for vitamin A deficiency is suggested.

Two Circle Grid Charts for Measuring Visual Acuity and Astigmatism, Edward B. Greene, *American Journal of Ophthalmology*, August, 1932, published monthly by the Ophthalmic Publishing Company, St. Louis, Mo. A list of variable factors in the visual acuity test situation was used as the basis for drawing specifications for a series of ideal test objects. Two charts, for use at six meters and at thirty centimeters, are illustrated; it is claimed that they test, simultaneously, visual acuity and astigmatism, that they are scarcely affected by difference in mental ability or language comprehension, and that they may be used by persons having a mental age of four years.

Ophthalmology in the Health Examination, John N. Evans, M.D., *New York State Journal of Medicine*, July 15, 1932, published twice a month by the Medical Society of the State of New York, New York, N. Y. One of a series of brief notes on the specialties in general health examinations; the author claims that the ophthalmological examination supplies general health information comparing favorably with the finest of laboratory data.

Good Lighting, W. E. Clemson, *Factory and Industrial Management,* August, 1932, published monthly by McGraw-Hill, New York, N. Y. Refuting the statement that good lighting is not generally found in factories where heavy manufacturing is carried on, nine interior views of factories are shown where the lighting is well conceived and executed to improve visibility and to prevent accidents.

Book Reviews

MEDICAL SUPERVISION AND SERVICE IN INDUSTRY. New York: National Industrial Conference Board, Inc., 1931. 125 p.

This is a revision of two previous studies published by the National Industrial Conference Board and has the advantage of comparing statistics which were previously compiled with important new material.

A special feature of the study is the inclusion of 53 per cent of the companies employing less than 1,000 employees.

As the monograph states, "A gradual shifting of emphasis from the curative phases of medical care to preventive work and health education is evident. With this development have come corresponding changes in the personnel and equipment of medical departments and in the average cost per employee. Aside from the sociological benefits resulting from the improved medical care of the employees, there has been a reduction of compensation costs and of waste involved in excessive labor turnover, absenteeism, and low labor efficiency."

The chapter headings indicate fairly well the scope of this publication: "The Place of the Medical Department in Industry"—"Staff and Equipment"—"Physical Examination of Employees"—"Industrial Accidents and Their Treatment"—"Diagnosis, Treatment, and Prevention of Illness"—"Medical Work in the Small Plant"—"Medical Records"—"Analysis of Work of Medical Department"—"Cost of Medical Supervision and Service"—"The Value of Medical Work in Industry."

A valuable addition is the appendix, which includes routine and standardized procedures in physical examinations, first aid treatment, a standardized medical terminology, and last, but not least, the estimated value of medical service in a company of 500 employees.

This is a valuable reference work for anyone who has to do with industrial health and safety in any of its aspects.

Except for mention of the technique for the examination of vision in industry, and a statement concerning the employment

of oculists, this book does not go into the subject of the prevention of blindness and the conservation of sight.

C. O. SAPPINGTON, M.D., DR. P. H.

Briefer Comment

MANUAL OF PUBLIC HEALTH NURSING. Prepared by the National Organization for Public Health Nursing. New York: The Macmillan Company, 1932. 253 p.

This is the second and completely revised edition of the *Manual*, intended "to suggest procedures which may serve as a guide primarily to the nurse in the field, and which may be applied to county, small community, state or large city services." It is a comprehensive handbook containing definite information on every phase of public health nursing. Suggestions for eye care are made throughout, beginning with the care of the eyes at birth and during the postpartum period, the importance of detecting and correcting squint and other visual defects during the preschool age, the technique in detail for making vision tests, lighting in the school and industry, and first-aid treatments for the removal of foreign bodies in the eye. Gonorrheal ophthalmia neonatorum is discussed with other communicable diseases; it is pointed out that six out of ten cases of ophthalmia neonatorum are due to the gonococcus. Perhaps there should also have been a mention made of the danger from secondary infection, and the absolute necessity for immediate and thorough medical and nursing care in order to prevent blindness or loss of sight, regardless of the type of infection. Nurses in many parts of the country might have found a paragraph on trachoma helpful.

The *Manual* is an excellent production, a great improvement on the first edition and is sure to be of great assistance to all public health nurses, but particularly to those who work alone.

PROCEEDINGS OF THE NATIONAL CONFERENCE ON COLLEGE HYGIENE. New York: National Tuberculosis Association, 1931. 88 p.

"How can a college hygiene program best be organized and operated?" was the question confronting the President's Committee of Fifty on College Hygiene, when they met at Syracuse in

May, 1931, with representatives of the National Health Council and the American Student Health Association. Dividing their reports into four sections, Health Service, Health Teaching, Organization and Correlation of Factors in College Hygiene, and Special Problems, they have set down criteria that apply equally to the large and the small institution. Among the special problems are: sex education and social hygiene, the prevention and control of tuberculosis, mental hygiene, extra-curricular activities and conditions, and nursing problems. Although this book is primarily a foundation for a college health program, its precepts should have a constructive effect upon the health of a new generation, of whom today's college students will be the parents.

THE HEALTH OF THE SCHOOL CHILD, A STUDY OF SICKNESS, PHYSICAL DEFECTS AND MORTALITY. Public Health Bulletin No. 200. Washington: United States Treasury Department, Public Health Service, 1931. 159 p.

In a study which has taken several communities as typical of the nation as a whole, the figures that have to do with diseases of the eye and eye defects are of particular interest to those concerned with the prevention of blindness and the conservation of sight. While the study makes no attempt to draw conclusions, some of the facts are pertinent:

Eye diseases in these communities were nineteenth on the list of reasons for school absences; vision defects, on the other hand, were second on the list, with 32.46 per cent of the children showing refractive errors varying from a slight degree to definite visual handicaps; 19 per cent of the children had vision defects so great as to need correction; eye defects were more frequent in girls than in boys, as 15 per cent more girls than boys had seriously defective vision. According to these figures, more than 90 per cent of the children entering school have hyperopia to a mild degree, this defect decreasing with age, while myopia increases rapidly up to the age of 12. Strabismus is more prevalent in the lower grades than in the upper, probably because a cosmetic correction is made during the early school years through glasses or operation.

BOOKS FOR TIRED EYES. Charlotte Matson. Chicago: American Library Association, 1931. 59 p.

For the many people who find the ordinary book an eye-fatiguing chore, this list of books printed in large legible type will be most welcome. More gratifying even than the length of the list is its cosmopolitan selection, with books to appeal to every reader—fiction, travel, biography, poetry and history books, printed in 12-point type or larger. Many of these books kept in the hospital or convalescent-home library would mitigate eyestrain without depriving patients of the privilege of reading.

PUBLIC SCHOOL EDUCATION OF ATYPICAL CHILDREN. Bulletin No. 10, Robert W. Kunzig. Washington: United States Government Printing Office, 1931. 160 p.

The White House Conference, which called together the authorities on special care for handicapped children, as well as those for the normal care of normal children, and its reports have aroused interest throughout the country in the question of equal opportunities for all children. This particular study analyzes the opportunities offered in the public school systems in states with cities of over 100,000 population, indicating (1) state control of special education; (2) the nature of state aids; (3) the trend of legislation; (4) the administration of state control of special education.

A second study is made of the organization and working of such classes in cities of over 100,000 population, as typical of the local situation in these states. The cost of special education to the states and the local centers is analyzed and comparisons made.

EDUCATION IN BELGIUM. James F. Abel. Washington: United States Government Printing Office, Bulletin No. 5, 1932. 145 p.

A study of educational organization, administration, methods and principles in Belgium; an interesting note is struck in training teachers to teach hygiene by taking care of their personal health. Ability to detect defects, through observation and testing, is part of each elementary teacher's requirements.

A SURVEY OF HEALTH ORGANIZATION AND SERVICE IN ONTARIO COUNTY, NEW YORK, 1930. Allen W. Freeman, M.D. New York: State Charities Aid Association, 1932. 90 p.

Co-operation in services, on the part of educational, nursing and hospital authorities, is the basis of the well-rounded health service described in this survey, which was made at the request of the State Charities Aid Association and the New York State Department of Health.

TWELFTH ANNUAL REPORT OF THE INDUSTRIAL HEALTH RESEARCH BOARD TO THE MEDICAL RESEARCH COUNCIL. London: His Majesty's Stationery Office, 1932. 57 p.

A non-technical report of the work of the Industrial Health Research Board towards the solution of the human problems created by modern industrial conditions. Of special interest to readers of the SIGHT-SAVING REVIEW are the discussions of research in relation to lighting and output, fatigue, eyestrain and psychological factors.

ANNUAL REPORT, EASTERN ASSOCIATION ON INDIAN AFFAIRS, 1932. 14 p.

As a summary of the year in vocational projects and social and health activities among the Indians, this report indicates to what extent the present economic depression will affect future health. Less ready markets for the craft products of the Indians, widespread unemployment and budget reductions are causing immediate distress; the energy of those in charge of Indian affairs must compensate for the coming decrease of $1,000,000 in health appropriation and the one-third cut in the fund for a clinical survey of trachoma, tuberculosis and venereal disease among these people.

Contributors to This Issue

Dr. Luther C. Peter, professor of ophthalmology, Graduate School of the University of Pennsylvania, is the author of several texts, namely, *The Extra-Ocular Muscles* and *The Principles and Practice of Perimetry*. His international reputation as an authority on squint is evidenced by the invitation accorded him to address the Oxford Ophthalmological Congress in July on "The Treatment of Non-Paralytic Squint."

Mrs. Winifred Hathaway, as associate director of the National Society, needs no introduction to anyone concerned with sight conservation. Her special concentration on the development of sight-saving class work fits her singularly for the subject with which she deals in this issue.

Dr. Park Lewis, who has contributed previously to THE SIGHT-SAVING REVIEW, is recognized as an active participator, nationally and internationally, in the work of prevention of blindness. Although a busy practicing ophthalmologist in Buffalo, N. Y., he finds time to act as vice-president of the International Association for the Prevention of Blindness, among his other altruistic activities.

Mr. Lewis H. Carris is managing director of the National Society for the Prevention of Blindness.

Dr. Frank H. Rodin is instructor in ophthalmology at the Stanford University Medical School, and chief of eye service at that clinic and at the Mt. Zion Hospital. His special contribution to the work of the San Francisco Department of Health is the supervision of the sight-saving classes in the public schools, and the examination of all school children with markedly defective vision.

Mr. Louis Resnick, formerly editor of the *National Safety News* is director of industrial relations of the National Society.

Our book reviewer, **Dr. C. O. Sappington,** is director of the division of industrial health of the National Safety Council.